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Reducing the incidence and severity of staff manual handling injuries through continuous improvement

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REDUCING THE INCIDENCE AND SEVERITY OF STAFF MANUAL HANDLING INJURIES THROUGH CONTINUOUS IMPROVEMENT

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ABBREVIATIONS

C.I.	Continuous improvement
DSE	Department of School Education
SSP	School for Specific Purposes
O.H. & S.	Occupational Health & Safety
W.C.	Worker's Compensation
T.Q.M.	Total Quality Management
P.D.C.A.	Plan Do Check Act
N.S.C.A.	National Safety Council of Australia
A.C.T.U.	Australian Council of Trade Unions
L.S.L.	Long Service Leave
S.P.C.	Statistical Process Control
P.S.A.	Public Service Association
RFF	Release from Face-to-Face Teaching

DEFINITION OF TERMS

Anthropometry	The measurement of human range of movement of limbs and muscle strength (Worksafe 1986).
Biomechanics	Mechanical science of the body. How gravity affects the skeleton and muscles (Worksafe 1986).
Culture	"The way things are done around here" (Crosling & Munzberg 1993:12).
Drop Fit	An epileptic seizure where the person involved has no warning and drops down instantly. Some twitching may continue for a few minutes.
Ergonomics	"Recognized discipline in relation to assessing whether the work, equipment, or environment match the capacities of the people concerned" (McAtamney & Corlett 1992:965).
Hazard	"The potential for harm or loss" (Dawson, Poynter & Stevens, 1983 :434).
Incidence	Occurrence of a phenomena over time (Worksafe 1986).
Intellectually Severe	The Intelligence Quotient (I.Q.) is measured at under 30. Many students who are not assessable are presumed at this level.
Job redesign	Redesigning jobs and or work stations (Worksafe 1986).
Manual handling	One or more persons ..."lifting, lowering, pushing, pulling, carrying, moving, holding or restraining any object, animal or person."(Worksafe 1992 a:1).
Musculoskeletal	Pertaining to the muscles, and includes the skeleton as well as the joints (Timiras 1994).

Paradigm	"A model of reality in a specific context or area of life. each paradigm consists of a systematic set of beliefs, attitudes and assumptions" (Wollongong Uni PAGE Consortium Mgmt 911 Handout).
Prevalence	The number of injuries/disease (Worksafe 1986).
Proactive	Actions taken in anticipation, preventative actions.
Quality	"Satisfying or delighting the customer" (Spencer 1994).
Risk	The probability and consequence of a particular event (Joy 1993).
Risk management	The process of identifying the risks and assessing those risks. A proactive approach (Joy 1993).
Sprains/Strains	Trauma to muscles and ligaments.
Statistical Measure	The collection and analysis of data.
Statistical Process Control	The use of any statistical measure to determine whether a process is stable or not.
T.Q.M.	Quality paradigm based upon the philosophies to quality gurus such as Deming, Juran and Crosby.

ABSTRACT

Occupational Health & Safety (O.H.&S.) is currently legislated federally and within each state. Workplace injuries and diseases extract a significant human and financial cost per annum, with these costs continuing to escalate. There is substantial evidence that effective safety programs designed to meet the needs of each workplace decrease the incidence and severity of workplace injuries and diseases which in turn result in financial and human benefits. Some organisations view safety management as an integral component of Total Quality Management (TQM) and are implementing TQM strategies to achieve improvements. The role of management is seen as crucial in implementing effective safety programs.

Manual Handling is a significant O.H.&S. problem in Australia, and attracts its own Regulation and Standard. Within NSW both are mandatory. Currently almost 34% of W.C. claims are the result of manual handling injuries. These injuries predominantly affect the musculoskeletal system, particularly the back.

Staff at one NSW Department of School Education (DSE) school are eager to reduce the number of body stressing injuries occurring due to their manual handling of students who suffer from severe physical disabilities. They are unsure of the best approach to this problem. The staff are predominantly female, with the average age over 43 years.

The school in question employs a small number of staff and currently has a major injury incidence rate of 50 (per 1000) which is comparable to the construction industry. Education (together with museum and library) is generally in the region of 5 (per 1000) according to the Workcover Authority Statistics Branch.

The DSE provides minimum support and priority to O.H.&S. There are formal O.H.&S. committees where only some members are trained. The DSE's Risk Management Awareness inservice has not been implemented in at least one region which covers 223 schools. Thus principals in this region (at least) do not know that the DSE policy and current approach to Risk Management exists, let alone possess proficiency in conducting risk assessments.

The research comprised two questionnaires (at the beginning and conclusion respectively), with a four week checksheet (on pain whilst lifting) following questionnaire one. A ten week stretching program was commenced at the conclusion of the checksheet to complement the school's recently introduced morning exercise classes. In total the research was conducted over a fifteen week period, although meetings with the school's Occupational Health & Safety committee extended beyond this period.

The initial questionnaire had a response rate of 63% and showed that most respondents (73%) had sustained a workplace injury. The checksheet had a response rate of 18% with the majority (82%) experiencing pain at some period throughout the four weeks. The final questionnaire also had a response rate of 18%, with all respondents claiming that there are some manual handling risks at the school.

It was difficult to accurately analyse results from the research due to the following factors:

1. Background information about all staff (gender, ages etc) was not provided by the school. It was therefore not possible to determine what percentage of staff had actually been injured in total or within the age bands used throughout the research.

2. Staff injury records were provided for a six month period only and in the form of Appendix X. This meant that there could not be a thorough analysis of injury information or any determination of trends.

3. The low response rate of the checksheet (Appendix G) and the second questionnaire (Appendix I).

In terms of the eight research objectives (p13) most were achieved. Objectives one and six were not achieved due to the above points.

The intervention strategy of preparing muscles for manual handling via a stretching and flexing program was developed and implemented to prepare muscles for the manual handling tasks that staff are required to perform. It was designed to complement the school's exercise program. The approach while important, overlooked the current legislative focus of designing the job to meet the needs of the employee. While it is possible for the school to implement changes to its safety management there are barriers that impede its progress. The school is still part of a large bureaucracy and governed by them in terms of priorities and financial practice. The culture of the organisation is strong and in line with most large organisations has a reactive O.H.&S. focus.

Literature analysis found that there are divergent approaches in the programs designed to reduce the occurrence and severity of these injuries. While there is an abundance of information regarding manual handling injuries generally, no information regarding their incidence in schools was found. However, there is research to suggest that the best approach the school could take for the future is a combination of three factors

1) Training & development
   in manual handling methods
2) Ergonomic Intervention
   - strategies to circumvent manual handling
   - work station redesign
   - work practice redesign
3) Medical screening
   - health promotion

This pluralist approach combined with a continuous improvement cycle should (if adopted by the school) result in significant improvements in their O.H.&S. management particularly if incorporated into a TQM approach of maximum employee participation and teamwork.

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CHAPTER ONE

INTRODUCTION AND SETTING OF THE PROBLEM

1.1 Background

The Department of School Education (DSE) in New South Wales (NSW) has undergone major restructuring since 1989. This was based upon two reports:

1. The Committee of NSW Schools (1989), commonly referred to as The Carrick Report (after the chairman, Sir John Carrick).

and

2. Schools Renewal and School Centred Education (1990), commonly referred to as The Scott Report (after the Director of the Management Review, Dr Brian W Scott).

The Carrick Report focused on teaching practice and learning, while the Scott Report looked at aspects of governance and management. Of the two reports it was Schools Renewal and School Centred Education (The Scott Report 1990) that had the greatest impact upon education in government schools. Its basis was restructuring and decentralisation of staffing and curriculum, to provide flexibility and autonomy to every school. Staff in Head Office were relocated or retired and Head Office changed from a large centralised bureaucracy to a small nucleus. Decision making and budgets were devolved to regions and schools. There was a total reversal of emphasis from the school supporting the DSE, to the DSE supporting schools (School Renewal 1990).

Since the implementation of most of The Scott Report's recommendations the

role of the Principal has changed markedly. Whereas previously Principals were predominantly concerned with facilitating teaching and learning, they emerged as key stakeholders and decision makers with responsibility for finances, administration and resources (both human and physical), as well as curriculum (Cranston 1994). Their function became that of a link between school and Regional Offices. They came to be perceived by the DSE as on site managers responsible for the day-to-day functioning of the school (School Renewal 1990).

Together with the above domains, Principals are also responsible for Occupational Health and Safety within their schools. They are required to employ staff (to replace those absent due to illness or injury), as well as ensure that the workplace is safe for staff and students alike. It is the responsibility of each NSW Department of School Education Principal to ensure that their school adheres to the current OH&S legislation (Ailwood 1995 b).

Under the current Occupational Health & Safety Act NSW 1983, there are two ways an organisation can form an on site O. H. & S. committee. The first is when 20 or more employees request the formation of such a committee, the second is when the organisation is directed to form a committee by the Workcover Authority of NSW. This is the Government body charged with regulating an organisation's adherence to current O.H.&S. legislation, and includes rehabilitation as well as workers' compensation. Therefore, unless directed by the Workcover Authority of NSW, it is not possible for workplaces with less than 20 employees to establish a formal O.H.&S. committee in this State.

The NSW Department of School Education is currently divided into ten

regions. The South Coast Region is one of them and geographically is located between Helensburgh in the north, the Victorian border in the south, the ocean in the east and Bowral and the Snowy Mountains in the west. There are 223 schools in this region with approximately 5000 staff members. Of these 223 schools, 72 (32%) have 20 or more staff members (Ailwood 1994), and therefore meet the criterion to initiate the establishment of a formal O.H.&S. committee. At the end of 1994, 47 such committees had been formed. Therefore, 21% of schools in the South Coast Region currently have formal OH&S committees (Ailwood 1994). Many of these committees have at least one member trained in OH&S, and to date (October 1995) 5 Principals (2.2%) have been trained (Ailwood 1995 b). In each Regional Office it is the Director of Personnel who has the prime responsibility for O.H.&S.

There are some distinctive aspects within the devolved education system, particularly in reference to financing. While schools are in charge of their own budgets, it is Head Office accounting personnel who determine their size, based upon a formula developed by them using amalgamations of previous years' records. The costs associated with staff absences are paid for in two separate and distinct ways. Where the absence is up to and including 10 consecutive working days, it is the school who pays for the cost of hiring replacement staff. However, when the absence exceeds 10 days it is the respective Regional Office who meets the cost of the total absence. This formula operates for <u>every</u> type of leave. Previous years Workers' Compensation (W.C.) claims are not part of the formula used to determine school budgets (Ailwood 1994). Therefore, if some schools have a higher incidence of W.C. absence (due to the nature of their job), then this is not reflected within their fiscal allocation (Ailwood 1994). This anomaly continues as each Regional Office provides some costs towards the training of OH&S committee members while the school meets the balance. Region pays for all

medical and related W.C. costs. Therefore, the direct costs of W. C. are met jointly by the Region and the school.

The DSE in NSW is self insured and does not have insurance premiums as such. To cover the direct costs of Workers' Compensation each Region is allocated a Treasury Managed Fund per fiscal year. This fund covers the costs of W.C., property, legal liability as well as miscellaneous costs (DSE 1993), and is administrated by the Government Insurance Office (GIO).

Table 1.1.1. Costs of W.C. in The South Coast Region

YEAR	Budget	% Increase on previous year	Total Costs	% Increase on previous year	Costs of Sprains/Strains	% Increase on previous year
1991-92	$ 830 000		$ 744 714		$ 369 284	
1992-93	$ 900 000	8.5%	$ 943 609	26.7%	$ 399 888	8.3%
1993-94	$ 1 200 000	33.3%	$ 1 264 650	34%	$ 548 276	37.1%
1994-95	$ 1 675 000	39.6 %				

Source : DSE Risk Management Policy Unit

The DSE's Risk Management Policy Unit developed a comprehensive, relevant Risk Management Awareness Package for the inservicing of all Principals (DSE 1993). This package was sent to all Regional Office Personnel Managers. The program (Appendix A) is structured as a four hour inservice with handouts for Principals to facilitate them to learn, understand and implement risk assessment within each of their schools. It lists Principals' risk management responsibilities as "Protection of : Departmental assets, staff and students' health and safety, and departmental liability" (DSE 1993 :13). Within this package it states the average cost of property repairs between 1989 and 1992 as $18 million annually (DSE 1993 2.1 Presenter's Notes), and how it is possible to reduce this amount using risk management. The program defines risk assessment, its benefits and how it can be implemented.

Also outlined are the various risk control methods (Appendix B), each school can adopt depending upon the risk.

There was only one minor problem with the package. It was not presented to the Principals in the South Coast Region (Ailwood 1995 b). The exact reason for this is not known. Some possible explanations are that the DSE underwent a shift in policy emphasis making the approach obsolete (the head of the Risk Management Policy Unit inferred the opposite), there was no-one available to present this package (it includes a train-the-trainer component), or it may have been deemed as not important enough, particularly when replacement staff would need to be hired to release all teaching principals. While these reasons are speculative, they do suggest a lack of O.H.&S. priority generally. In fact, the Risk Management Policy Unit has recently undergone a name change and is now the Administrative Systems Unit.

Relevant information pertaining to O.H.&S. is sent by GIO personnel to the DSE's Head Office Risk Management (Administrative Systems) staff. Here it is analysed and synthesised prior to being circulated to the Personnel Director and Manager at each Regional Office. Current practice is that this information is not to be released below this hierarchy without permission from the DSE's Director General. Permission to use information regarding the trends in O.H.&S. across the South Coast Region was eventually granted.

In January 1995 the DSE's South Coast Region's Personnel Manager issued a memo (to all Principals and above), outlining the current approach for manual handling. Included with the memo was information from the Workcover Authority in NSW on the recommended squat lift, risk assessment procedures and back care strategies (Ailwood 1995 a).

Within the DSE there are many different types of schools ranging from preschool, primary, and secondary through to special education schools called Schools for Specific Purposes (SSPs). It is within an SSP that this research is conducted.

1.2 Research Problem

Each year billions of dollars are spent on paying the bills for Workers' Compensation (Worksafe 1994 c). Thousands of people are affected by the resultant pain and suffering of these injuries and diseases. Legislation in New South Wales and federally in Australia has highlighted Occupational Health and Safety as a priority in an effort to reduce these negative impacts. While effective legislation (NSW Occupational Health & Safety Act 1983) has been in force since 1983, there is ample evidence to suggest that the incidence of workplace accidents and disease is still too high and in some areas increasing (Worksafe 1994 c).

Information from the DSE, shows that throughout the South Coast Region musculoskeletal sprains and strains is consistently the most frequently occurring workplace injury or disease (Figure 1.2.1.).

Wattle St School for Specific Purposes (SSP)[1] caters for a diverse intellectual and physical ability range of students. A significant proportion of these students have severe physical disabilities and staff are required (among other things) to manually lift these students regularly. Over 70% of injuries to staff at Wattle St. SSP (using data from a six month period) are musculoskeletal in nature (sprains and strains), and are significantly higher than any other form of injury (Figure 1.2.2). While most of these injuries are very minor and require

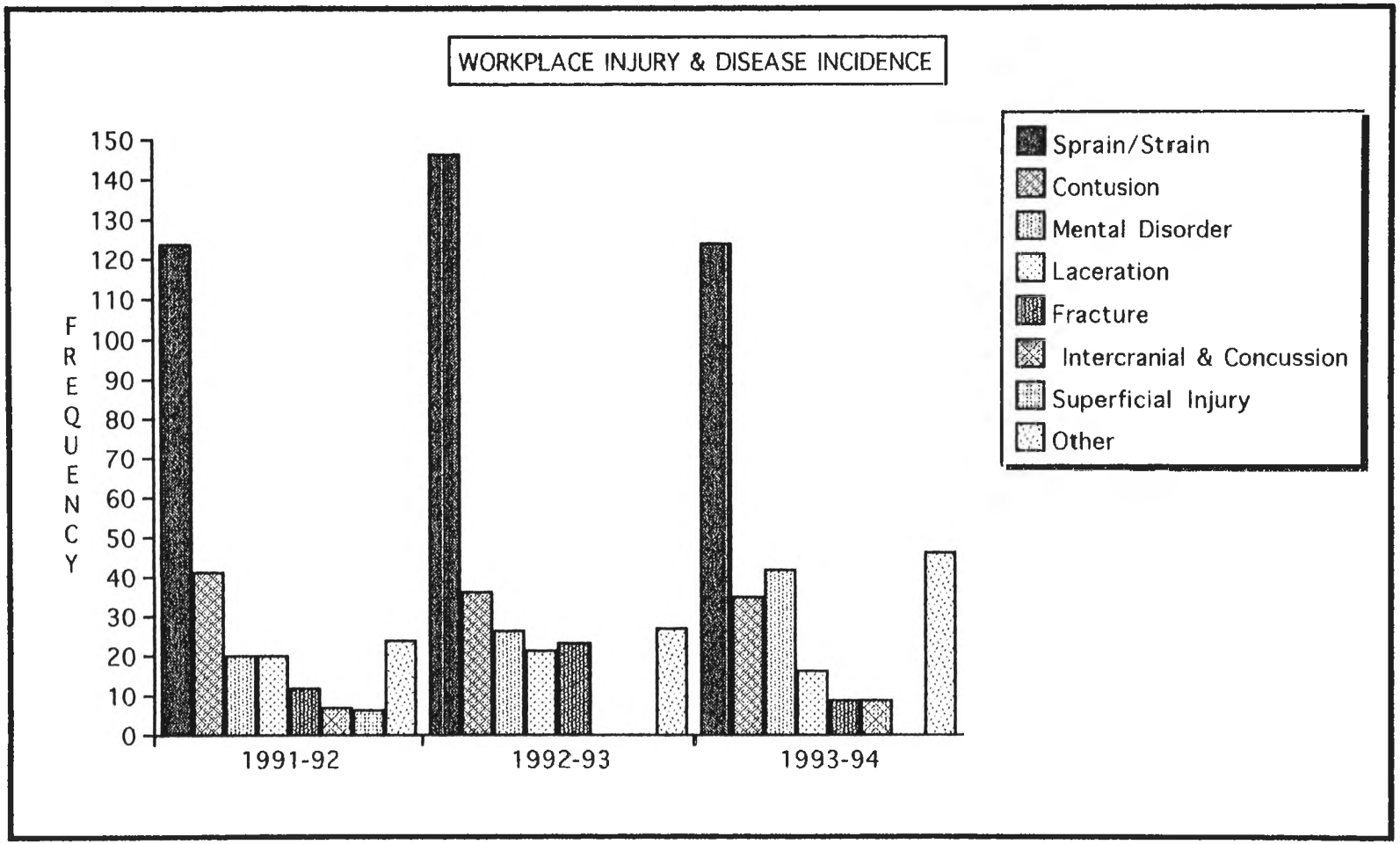
[1] The school does not wish to be identified so the name Wattle St SSP is being used.

NSW DEPARTMENT of SCHOOL EDUCATION

WORKERS COMPENSATION

SOUTH COAST REGION

Figure 1.2.1. Nature of Injury and Disease



WATTLE ST SSP

STAFF INJURIES FOR FEBRUARY - JULY 1995

Figure 1.2.2 Nature of Injury

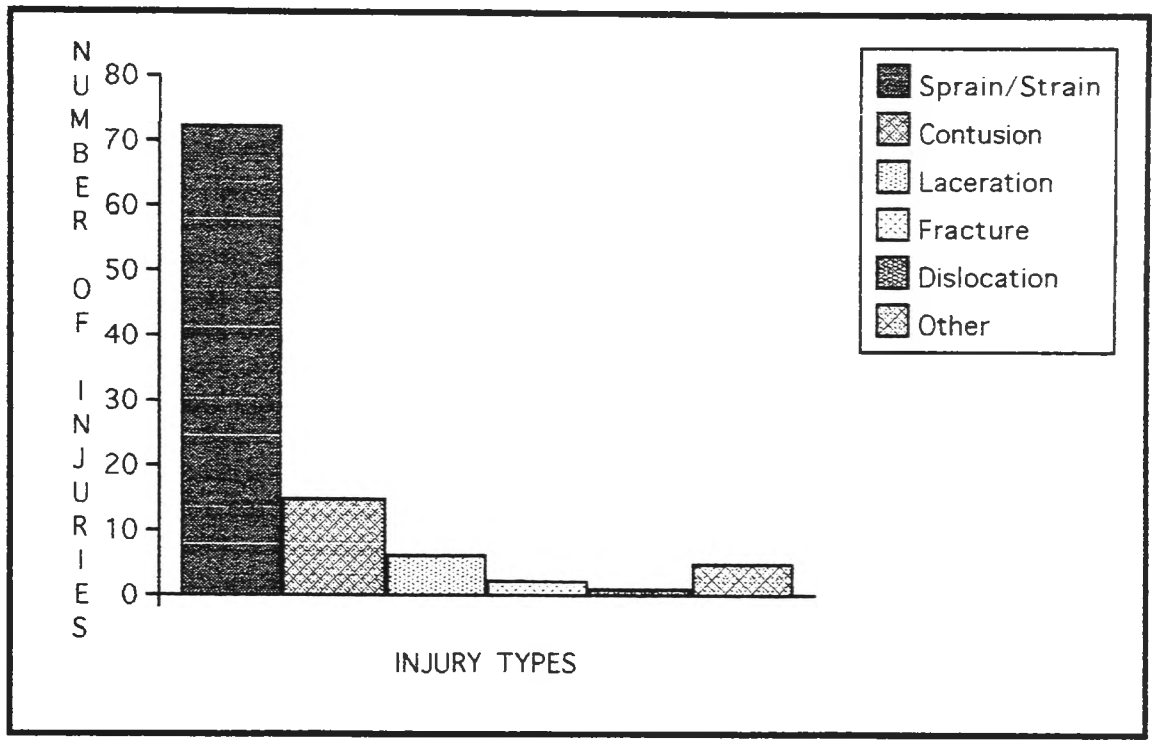
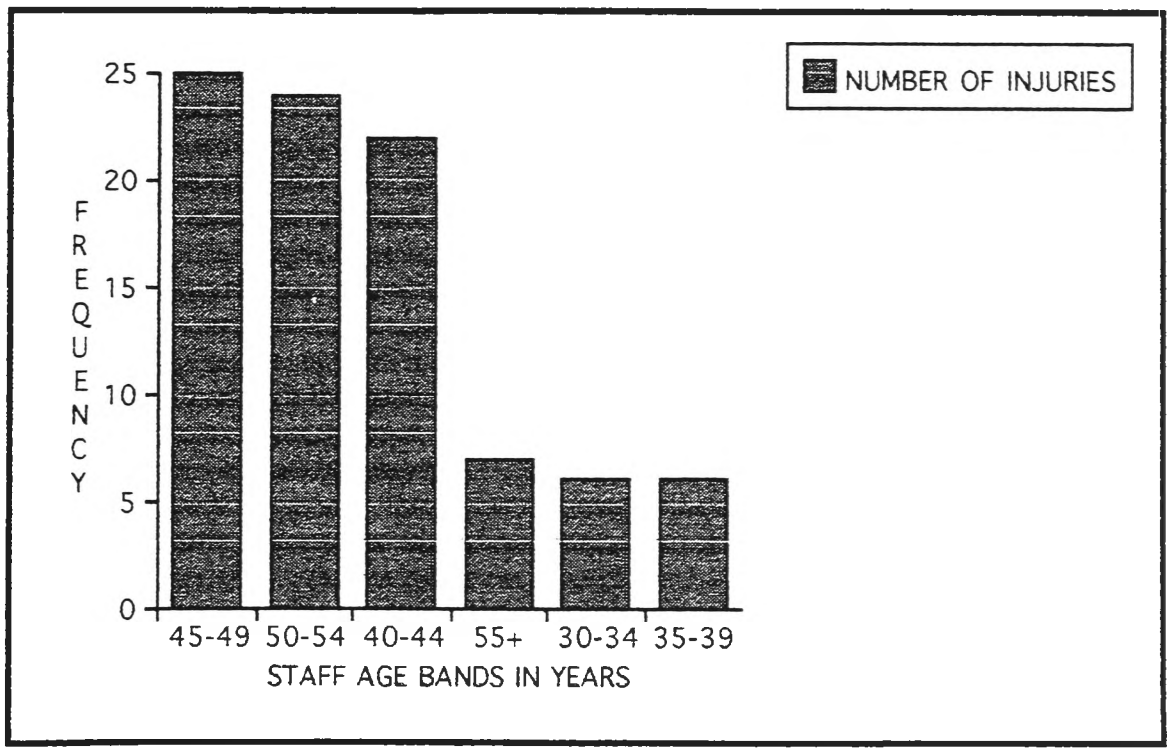


Figure 1.2.3 Frequency of Injuries



no intervention, staff (particularly those working with students who have these severe physical disabilities), are concerned and desire an intervention strategy to reduce the incidence of these injuries.

The staff at the school (sixty in total), are mainly female (88%). Most have been employed by the DSE for over 10 years and many are over 45 years of age (Principal's input). Research cites age (Barry et al 1993; Qld Nurses Union 1991), and the onset of menopause (Barry et al 1993) as factors to consider in relation to muscle deterioration. Many staff members at the school have already been injured at their workplace (Figure 1.2.3) before they reach these additional age complications. Recent amendments to the compulsory retirement age in NSW, may be a factor for future consideration by the school.

Since the beginning of 1993 the school has had a formal O.H.&S. committee. In the same year the chairperson underwent training only to be relocated at the end of the year after sustaining a major work related injury. In 1994, staff elected a replacement member, a new chairperson was selected and in September the whole committee was trained in O.H.&S. Two weeks later the chairperson received a service transfer effective at the beginning of 1995. Therefore, in February 1995 another person was elected as a staff representative and was subsequently selected by the committee as the third chairperson (in as many years).

In 1993 after a major musculoskeletal injury to a staff member, the school underwent an ergonomic assessment by two trained occupational therapists who assessed the role of staff in relation to the manual handling of students. The injury was sustained while toileting a student and therefore the thrust of the assessment was on appropriate infrastructures. As a result the school has recently undergone physical redesign of some toileting and shower facilities.

The school is also steadily increasing its acquisition of mechanical equipment to assist in student lifting.

Discussions with staff confirm that they are well aware of the DSE's recommended lifting procedure. They say they use the squat lift with their backs straight, feet slightly apart and knees bent. The school has held regular training and development sessions for existing staff to revisit this lifting technique as well as for new staff to learn it.

Yet, staff at the school continue to be injured. Their current records indicate that there are 84 separate entries in the staff injury book for a 6 month period. Two of these injuries were major, and given that there are a total of 60 staff employed, this is an average of 1.4 entries per staff member in a six month period. There has been a total of 3 staff members who have sustained a major injury during the 1994-1995 financial year. Using the Workcover Authority's formula to determine injury prevalence, this translates into a incidence rate of 50/1000. All three injuries are the result of manual handling, and resulted in musculoskeletal injuries. Staff would like to know how this rate of injury can be reduced.

1.3 Organisational Importance.

Each year the DSE spends substantial amounts of money on O.H.&S. by paying the bills via the Treasury Managed Fund (Table 1.1.1.). The approach is reactive, based on repairing the symptoms, ie., the injuries and diseases. There is little to no time or money spent determining the causes of these injuries and diseases, and developing strategies to preempt their occurrence. Proactive measures have very set guidelines. They must be applicable to each and every school in the state, and approval for the pilot program must be

sought from Head Office personnel. If approved then the initial funding must be withdrawn from the relevant Region's W.C. Treasury Managed Fund (Ailwood 1994).

The advantages in reducing the incidence and severity of injury due to manual materials handling are numerous. While some organisational safety programs are generic O.H.&S. approaches to improve general health and wellbeing (Kerr & Vos 1993; Wachsman & Swanson 1992; Zechetmayr 1992; Cacioppe & Samson 1986), others are specifically aimed at material manual handling (Genaidy et al 1994; Feldstein et al 1993; Gunsch 1993).

Perry (1994) believes that one of the most beneficial advantages of effective safety programs is cutting the direct and indirect cost of W.C., and can be achieved by developing and implementing a safety program that involves all employees, and uses incentives. Kerr & Vos (1993) along with Cacioppe & Samson (1986) agree that safety programs cut costs but they believe the approach should be an employee fitness program which will improve productivity and employee morale while decreasing absenteeism, staff turnover and the health care costs of the company. Epes (1994) also believes that healthy employee programs result in happier and more productive employees. Areas to be included in programs are weight reduction, improving physical fitness, quitting smoking and healthier diets. Rinefort (1992) believes effective safety programs would stop the current financial drain upon nations. Nelson (1994) concurs with Rinefort and believes there are many ways in which to reduce costs and that management's attitude plays a key role.

Matthes (1992 b) advocates the ergonomic assessment approach and discusses the value of indirect lighting, stretching before, during and after work, as well as the importance of posture in order to improve employee

efficiency. His research was in the area of office staff and included the aspect of sick building syndrome from poor ventilation. Matthes estimated that ergonomic improvements could equal 2½% of each employee's annual salary.

Through risk assessment and analysis, organisations could save up to 90% of their W.C. costs (Lanier 1992). Where the approach to proactive safety management was a team approach, Lanier found that additional benefits of improved morale and camaraderie amongst workers emerged.

In the area of manual handling Shi (1993) found that without effective back care programs up to 66% of staff that have to lift, could develop back problems. However, through back exercises, stress management, and general fitness programs the cost of W.C. in one intervention group fell by 15.9% while the control group's W.C. costs rose by 17%. Shi also found that employees' job satisfaction rose. The organisation involved in the program estimated the return on their outlay was 179%. Gunsch (1993) also looked at an organisation where employees were required to manually handle. The organisation introduced a program to 'harden' muscles prior to lifting and bending, as well as providing voluntary daily exercise classes. Those employees not attending the daily exercise classes were found to be more likely to suffer a musculoskeletal injury. The organisation found it difficult to quantify the $ value of the program as it was a new organisation. However, they estimated the program saved 30-40% of their rehabilitation costs per annum. As well, staff appreciate the program, a culture of trust between management and shop floor has emerged, and staff morale is described as good.

Therefore, it appears to be in everyone's interest for organisations to develop

and implement effective safety programs. Given the overwhelming evidence to support the benefits it is at times difficult to comprehend an organisation's reluctance.

1.4 Methodology

1.4.1 Research Objective

The purpose of this research is to provide Wattle St SSP with sufficient information for them to determine the most appropriate manner in which to reduce the incidence and severity of their manual handling injuries. In order to be able to provide this information it was necessary to:

1. Determine the extent of current and past injuries at the school.
2. Determine the causes of these injuries.
3. Determine what external support was available to the school.
4. Conduct an analysis of pertinent literature to determine current O.H.&S. practices in general and manual handling in specific.
5. Synthesise the requirements and merits of current practices.
6. Determine what the current practices are at the school in relation to manual handling.
7. Determine mandates relating to manual handling - legislative and any directives from the DSE.
8. Provide a process within which the school may implement a safety program to reduce their incidence and severity of workplace injury.

1.4.2 Research Method

It was important to know what staff attitudes and perceptions were in relation to manual handling and the incidence of injuries at the school. Therefore qualitative, non-scientific subjective methods of questionnaires, observation,

formal meetings and discussions were used to obtain information from the staff at Wattle St SSP about baseline data such as gender, age and experience, previous injury history, and current methods of manual handling at the school. An interview and numerous discussions were held with the South Coast Region's Personnel Manager to determine DSE policy, funding and practices relating to O.H.&S. in general and manual handling specifically. Relevant documentation from the South Coast Regional Office was requested for perusal.

Limited documentation from the school was analysed in an effort to determine trends and possible causes of injury as well as, the types of injury, the agent and mechanism. Literature perusal was required to determine the current approaches and their relative merits, legislative requirements and implementation strategies.

Synthesis of all information was required to present the school with sufficient information for it to be able to determine the most effective safety program for Wattle St SSP.

The school's existing O.H.&S. committee was an active participant throughout all formal meetings and discussions at the school. The school has an O.H.&S. infrastructure on site to facilitate two way communication with staff.

1.4.3 Data Analysis

Data from the school relating to gender, job classification, work routine, injury mechanism, injury type, injured parts, and length of service were all presented on bar graphs as they contain all of the essential components of graphical displays (Tufte 1983). Some elementary statistical data was also compiled such as mean, median and mode with regard to staff ages and length of

service. Using the data from the school and the initial questionnaire the current possibility of sustaining an injury and the type of injury was estimated.

1.5 Staff Roles & Student Ability

The role of staff and the ability of students plays a crucial component in this research. It is important to note that while the staff are employed by the DSE in NSW and work within a school, the roles of some staff are more closely aligned to that of nursing homes, rather than classroom teaching as it is performed within primary and secondary schools throughout the state. More than half of the staff spend significant amounts of their school day lifting, lowering, carrying, positioning, feeding and restraining students who are non-ambulatory, severely physically disabled or, have an unsteady gait. This is not the case within primary/secondary schools.

The physical ability of the students at Wattle St SSP vary from those students who are in wheelchairs and incapable of voluntary movement to ambulatory students able to lead independent lives. In terms of students' intellectual ability the range is broad. A very small amount are able to find fulltime time open employment upon leaving school, while others will be forever dependent for even the most basic activities such as eating and drinking. Many of the students confined to wheelchairs are in the intellectually severe category. It is these students who need to be manually handled daily either by individual staff members or by a team of two staff members.

Many of the students arrive at school each morning in a mini bus, sitting in a car seat capsule. Upon arrival, staff manually lift the students out of the bus and place them into their wheelchairs and push these wheelchairs to designated areas. Students are sometimes unsettled with quite a few

experiencing occasional muscular spasms as they are being lifted out of the bus and placed into their wheelchairs. Due to space confinement it is usually only one staff member hunched within the bus handing students out through the door to other staff members. These students are also frequently restrained in their chairs for posture purposes and need to be correctly seated. This may take more than one person and more than one attempt. Staff have to carry in bags of laundry, washing and food for the students. While they may not be excessively heavy, they are all different weights and sizes as are the staff.

Throughout the day students in the wheelchairs are moved out of their wheelchairs for toileting, positioning, feeding and individual programs. The range of ability determines the range of equipment used. During toileting it ranges from potty chairs to toilets, or hydraulic change tables for those completely dependent. Students are also placed into a variety of mobility frames and positions throughout the day to maximise their mobility, muscle tone and bone density. The lifting of students is completed by two staff members where possible, but they (staff) frequently need to twist, turn and stretch to move the students as well as reach various straps to secure them. They also need to support the student (who may spasm or jerk throughout), while this is happening. Other students who have good mobility, may experience a drop fit while walking with or near a staff member.

In each class where the students are classified intellectually severe the staff to student ratio is 1 teacher to each 6 students with 1 fulltime teacher's aide (Special). Therefore, staff position, toilet, feed and move up to 6 students each day. It could be stated that many of these staff activities are similar to nursing and patient care, where staff lift, lower, carry, position, feed and restrain.

Therefore, for statistical comparisons, it is important to consider the value of

aligning the roles of some staff at this school together with staff in a nursing situation. It may also be that some of the answers the school is seeking are contained in nursing institutions.

1.6 Delimitations of this Research

This study is limited to one New South Wales Department of School Education 'School for Specific Purposes' (SSP). The rationale for this is that I am well acquainted with this school. I worked there casually between 1982 and 1985, and as a fulltime employee between 1989 and 1994. In 1992 the school formed an OH&S committee and I was selected as the teaching staff's representative. In 1994 I became the chairperson of that committee and attended (along with the rest of the school's OH&S committee) a National Safety Council Australia (NSCA) 4 day training course for DSE OH&S committee members. Therefore not only am I well known by the staff, I am well aware of staff roles, the school (in general) and their OH&S (in particular) committee's previous and current efforts in the area of proactive risk management.

1.7 Methodological Weakness in this Research

Since the beginning of 1995 I am no longer on staff at Wattle St SSP. Therefore, I am no longer on site and could not be for the duration of this research. The research was conducted with informal discussions with the school's senior management and formal meetings with the O.H.&S. committee. Except for the introductory staff meeting I have not formally spoken to the majority of staff and have had the Principal and O.H.&S. committee convey instructions, outlines, clarifications and information to the staff.

The school is not a Total Quality Management (T.Q.M.) organisation and has had no involvement with the concept and principles of T.Q.M., particularly the aspects such as customer focus, statistical process control, continuous improvement and process orientation. At no stage has any interest in T.Q.M. been expressed.

1.8 Total Quality Management and Safety

Total Quality Management (T.Q.M.) is committed to quality. It is concerned with improving every facet of an organisation, in a holistic manner (Lamm 1994). T.Q.M. evolved from the 1950 Total Quality Control approach in Japan (Crosling & Munzberg 1993) and while T.Q.M. is sometimes viewed as a nebulous concept it does have some very distinct principles (Dean & Bowen 1994). Some confusion re T.Q.M. may stem from the slightly divergent foci of the quality gurus such as Deming, Juran, Crosby and Feigenbaum (Dean & Bowen 1994). In its essence T.Q.M. is a quality paradigm. In order to achieve quality, T.Q.M.'s aim is to develop a process within organisations to facilitate their customer focus, continuous improvement and team approach (Blakemore 1989; Dean & Bowen 1994).

Some claim that there is a natural alliance between T.Q.M. and Safety Management (Lamm 1994; Lischeid & Leary 1994; Joy 1993). Safety is concerned with improving the workplace and work systems, as are T.Q.M. principles (Lischeid & Leary 1994). T.Q.M. advocates the use of quantitative measures to accurately monitor improvement, so too does an effective safety approach (Lamm 1994). Companies that thoroughly comprehend T.Q.M. see the link between the reduction of waste - either as a consequence of safety programs or good management (Joy 1993). Waste includes such components as human, product, time, space, or system (Blakemore 1989). T.Q.M. is

customer (internal and external) orientated. Internal customers are those people who also work within your organisation. In schools the students, as well as the staff are internal customers. What could be more internal customer oriented that providing an infrastructure geared towards each workers' safety? Maslow's Hierarchy of Needs (Robbins 1993) places safety in amongst the low order needs and between physiological (food, water shelter) and social (affection and friendship). Deming (1986) considered the philosophy and practice of 'doing it right the first time' to be an essential component of T.Q.M. Surely a safety program would desire the implementation of the same fundamental philosophy?

The NSW DSE is not a T.Q.M. organisation and has no stated intention to become one. There are however numerous schools adopting T.Q.M. principles independently, and South Coast Regional Office management personnel are reading T.Q.M. articles and books, many of which are then synthesised and distributed to school principals as possible future directions. The Director General of School Education as recently as April 1995 stated the importance of quality and continuous improvement as goals within the NSW Department of School Education (Boston 1995). Spencer (1994) believes that the dominant goal of T.Q.M. is targeting quality as a main priority.

By using Crosby's Quality Management Maturity Grid (Appendix C) as the safety management framework, it is possible to highlight the column relating to quality improvement actions. The first stage here is Uncertainty. This is where there is no real comprehension of what constitutes quality. There are no proactive strategies, and no perception that they are required. It would appear that this is where the Department of School Education of NSW is currently placed. The second stage is Awakening where there is some idea of what is needed but the motivation to become proactive is still short term and the

knowledge necessary for Enlightenment is not yet sufficient. This is where Wattle St SSP is currently placed.

What is needed is to identify a vision, and then determine the starting point, along with strategies to work towards achieving the goal. This would reduce waste and facilitate improved quality of staff life and productivity. People are now viewed as pivotal to the success of continuous improvement (Blakemore 1989).

People are now more focused on their quantity and quality of life (Robbins 1993). Employees are irritated when processes are not implemented properly. Insufficient funds are usually cited (by management) as the cause, and when major problems occur, finance is suddenly available to fix the problem, yet it always takes more money to repair a problem than to do it properly the first time (Brennan 1988). In this period of economic rationalisation it is no longer possible to continue to 'waste' resources. Blakemore (1989) estimated the level of waste at up to 40% in some organisations. The culture of cutting corners in the workplace must change. The Australian work ethic catch-phrase 'she'll be right' must be superseded. It must be replaced by doing it right the first time (Deming 1986). Where this is started within an organisation is irrelevant as long as it is started somewhere by someone. A logical to start would be within an effective safety program.

Each organisation, each country, has their own starting point for safety improvement. In Mexico, there is an organisation dealing with the issue of adequate sanitation (Butler & Teagarden 1993). Governments have highlighted safety through legislation. The challenge now is for every workplace to determine their starting point and work towards continuous improvement, in their pursuit of quality.

Given the above information, each and every organisation, including each worksite (such as a school), will have different problems as well as different starting points.

1.9 Outline of the Report

Chapter two contains a literature review in the areas germane to the topic. Information relating to the legal requirements of workplaces in NSW in O.H.&S. generally and manual handling specifically are discussed and their implications outlined.The financial and social cost of current workers' compensation claims are introduced. Current research in the value of developing and implementing safety programs are outlined together with the perceived benefits that effective safety programs have to offer an organisation. Manual handling is discussed at length, along with the benefits of incorporating a T.Q.M. approach with safety management. Chapter three introduces the aims and objectives of this research, and elaborates upon the research methodology. Chapter 4 contains the results and analysis of this research. Chapter 5 is the final chapter containing the conclusions, recommendations and implications for future research.

1.10 Summary

This chapter introduced the research report. It provided relevant background information on the NSW Department of School Education, and its restructuring. It also stated the research problem at one particular school and outlined why manual handling was occurring at this school. It provided a outline of the methodology used to research this problem. Some information about Total Quality Management and its relationship to safety management was provided. Limitations and methodological weaknesses of the project were

discussed. Pertinent information on the structure of O.H.&S. in the state of NSW was provided. Finally a synopsis of the report was presented.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Chapter Two looks at what the current state and federal legislation is in regard to O.H.&S. in general and also manual handling in specific. Included in the chapter are examples of the current financial and human cost that O.H.&S. injuries and diseases extract from Australians every year. Not only is the cost high, it remains on the increase despite increasing awareness in industry and government. There is evidence from numerous research studies to suggest that it is possible to reverse this trend, with the resultant benefits having positive, far reaching global ramifications. There is more than one approach to developing effective safety programs and some of the approaches applicable to manual handling are explored. The issue of manual handling is defined. What constitutes manual handling, how it can be done properly and various risk control approaches to it are expounded upon.The factors that impact upon staff who have to manually handle as part of their work practices are explored together with their implications.

The paradigm of Total Quality Management (T.Q.M.) is outlined. The role that it can play in the effective management of safety is identified, as well as the pivotal role of management in implementing effective safety programs. T.Q.M. is analysed to investigate its compatibility with the NSW public education school system in reducing the incidence of workers' compensation injuries.

2.1 Legislation

There are two factors that make it important to understand the role that Legislation has within the area of O.H.&S. Firstly, organisations (particularly their management personnel), must be made aware of their legal responsibilities under Common Law (Duty of Care), and Statutory Law (O.H.&S. Act). Secondly, the evolution and development of these laws helps to explain the current levels of industry awareness.

Australia has a comparatively long history of O.H.&S. legislation dating from 1870. As accidents happened and diseases were identified as work related, new legislation was enacted to cover the particular workplace or activity (Lamm 1994). The long term result was a plethora of ad hoc legislation by the 1970's. This was greatly streamlined in the 1980's by state (except Tasmania), territory and federal legislation (Schuler et al 1992). In Australia it is the States and Territory Acts which have primary responsibility in O.H.&S. The current Occupational Heath and Safety Act 1983 NSW is very specific concerning the employers' responsibility to create a safe and healthy workplace. Not only does Section 15 state that it is the responsibility of "...employers to ensure the health, safety and welfare of their employees" but it further states the employers responsibility as "...to provide...systems of work that are safe and without risks to health" (O.H.&S. Act 1983 NSW Section 15.2.a). Thus, the onus is very clearly on the employer to ensure i.e. "make certain" (Concise Oxford 1976:345) that safe practices and systems exist. There is also a common law 'duty of care' provision for employers to provide a safe workplace (N.S.C.A. Training Manual).

The current emphasis in O.H.&S. is such that the employer has to show what steps were taken by them to create a safe workplace and work system, rather

than the previous approach whereby the state had to prove that a violation occurred (Lamm 1994).

The Act allows for the establishment of O.H.&S. workplace committees where there are at least 20 employees and the majority desire such a committee (O.H.&S. Act Section 23.1). Section 23.2 cites the provision of forming a committee when directed by the WorkCover Authority. While WorkCover has suggested to employees that the formation of a committee would be advantageous, no such direction has been made to date (N.S.C.A. training course).

It is under Section 25 of the Act that the powers of Workplace Committees are listed. They cover worksite inspections, obtaining information pertaining to their workplace and the provision for O.H.&S. training. While committee members can conduct inspections and attend meetings, their role is advisory in nature.

With the establishment of the National Occupational Health and Safety Commission (NOHSC) in December 1985, the national focus on uniformity towards O.H.&S. in Australia commenced (Worksafe 1993a). In the United Kingdom the Roben's Report of 1972 provided the basis of their O.H.&S. legislation and Australia based its legislation upon the UK Act (Lamm 1994). The current approach to O.H.&S. is predominantly concerned with the employer knowing and complying with relevant standards. Regulations are concerned with generic workplaces and therefore may not be as valuable as a workplace specific approach. This is the basis of the emphasis for a new approach. New regulations due for release in 1995 contain a focus shift towards a risk assessment approach. Current information indicates this will not be a mandatory approach (Cross 1994).

Not only is there general legislation for O.H.&S., but some industries and activities receive their own advisory documentation due to their endemic nature or practice. One is these is the 'Manual Handling National Standard , National Code of Practice 1991', which may be cited as "The National Standard for Manual Handling" (Worksafe Australia 1990 a). The purpose of this Standard is to provide information about manual handling legislature and standards as well as give some practical advice in the process of manual handling. It states the employer's responsibility towards each individual's ergonomic requirements, rather than developing a system/practice based upon the 'average' employee (Worksafe Australia 1990 a). That is, its emphasis is to fit the job to the employee, not the other way around.

Within this Code of Practice section 2.10 suggests 3 strategies to be considered in/during manual handling.

> "a) Minimise the lifting and lowering forces exerted.
> b) Avoid the need for bending, twisting and reaching movements.
> c) Reduce pushing, pulling, carrying and holding"
>
> (Worksafe Australia 1990 a:20)

In 1991 Worksafe Australia published the Manual Handling :National Standard and National Code of Practice to assist industry in reducing the incidence and severity of manual handling injuries at the workplace. Within the O.H.&S. Act 1983 (NSW) there is an O.H.&S. (Manual Handling) Regulation 1991 which states that "The National Standard [Manual Handling] has effect as if it formed part of this Regulation" (Section 5A: 59), and applies to all workplaces other than mines which operate under the Coal Mines Regulation Act 1982 or the Mines Inspection Act 1901. This means that in NSW The National Standard has a mandatory status. This Standard has

adjusted its approach which was prescriptive, to a more descriptive and advisory one thus allowing workplaces more flexibility in determining the appropriate measures suitable for their individual workplaces. Unfortunately, it also allows for the possibility of less employee protection. The new Standard does not include the previously recommended maximum lifting load of 16 kgs for females (in all Australian states except W.A.). While the Australian Council of Trade Unions agreed that women should not be treated differently in legislature relating to maximum lifting limits, they believed that a maximum limit of 16 kgs should be mandated for all workers. This is not what occurred however, and both genders are possibly less protected than ever before. While feminists may applaud the withdrawal of the female lifting limit, it may well disadvantage females who need to manually lift within their jobs (Nyland & Kelly 1992). Included within The Standard is the requirement of each organisation involved in manual handling to complete a risk assessment.

Laws by themselves are insufficient to achieve change. An example of this is Mexico. Its legislation in O.H.&S. is adequate when compared to Australia, unfortunately it is poorly enforced (Butler & Teagarden 1993). The Industry Commission's inquiry (1995) into O.H.&S. found that there was insufficient incentive for industry to change its current approaches and practices in the area of O.H.&S. They further found that "... the average expected penalty for O.H.&S. legislation breach nationally was less than $33", (Industry Commission's inquiry 1995: 29). The challenge in Australia therefore, is to continue its focus on O.H.&S. (Worksafe 1993a), so that the legislation has relevance, and change in practice occurs. Worksafe Australia are currently unable to say if the shift of direction in the manual handling standard is effective. Within the next two years there will be an extensive evaluation of The Standard by WorkCover throughout Australia to determine its effectiveness.

2.2 The Economic, Human & Social Cost of O.H.&S. Injury and Disease

In 1990 Australia's weekly record with O.H.&S. was such that there were approximately 8 deaths and 6000 injuries/diseases under W.C. (Dobbie cited in Schuler et al 1992). In 1993/94 in NSW alone there were 58 589 employment injuries and 185 fatalities (WorkCover Authority NSW W.C. Statistics 1993/94). This represented an increase of 15% from the the previous financial year. There are direct and indirect costs associated with O.H.& S. It is not easy to calculate the exact direct monetary cost - due to lack of accurate statistical data (Worksafe 1994 c ; Wooden 1992), or staff taking sick leave instead of workers compensation (W.C.) leave (Wooden 1992).

Direct costs are usually in the form of insurance premiums which then pay for such things as medical and hospital, rehabilitation, funerals, pensions for dependents, property damage, and lost wages. Indirect costs include such aspects as, lost time due to administering first aid, interrupted work, administration time in determining cause of accident or injury, time lost in cleaning up the accident site, cost of replacement equipment and personnel, and lowered staff morale (Nelson 1994). It is almost impossible to determine the indirect cost. Some estimate the total cost to be six times the W.C. bill (Nelson 1994; Wooden 1992), while others calculate it at three to seven times this bill (Worksafe 1994c; Qld Nurses Union 1991). The Australian Bureau of Statistics estimated the 1992-93 direct cost of Workers Compensation in Australia to be $4.8 billion. They further calculated the total cost to be between $15 -> $37 billion (Worksafe 1994 a). The amount is unacceptably high.

Where an organisation is self insured (such as the DSE), they pay for all of the direct costs. Australia's Industry Commission Report (Industry Commission

1995), found that approximately 40% of costs associated with were incurred by an organisation.

In 1975 Joksch estimated that for every O.H.&S. death the total cost was between $US4000 and $US200000. Rinefort in 1977 estimated the cost of the loss of one life to be between $US179000 and $US260000. Given that the average weekly earnings for Australians (using ABS category 'all weekly earnings') was $A146.00 in 1975, $A213.60 in 1979, and $A548.20 in February 1995, then it is possible to compare the ratios to determine an estimate in today's cost of living at approximately $A18750 to $A937500 (Joksch) or $A572800 to $A832000 (Rinefort) for each work related loss of life.

Indirect costs transcend an organisation. When a worker is sick or injured this impacts upon family and friends. An injury and/or disease may be present 24 hours a day and may impact incessantly, not just during work hours. This could in turn, effect the nation's heath and welfare systems, as well as national productivity and international competitiveness. The company is indirectly affected not only by the dollar cost of this injury, and time lost because of it, but also by intangibles such as reduced morale (Gunsch 1993; Kerr & Vos 1993), and decreased job satisfaction (Shi 1993; Matthes 1992 b; Cacioppe & Samson 1986). The worker and their family's current and future productivity and quality of life may also be affected, depending upon the level of injury/disease and its resultant prognosis. When death occurs these detrimental effects escalate. An extreme example of this occurred at the death of Victor Chang (on his way to work). The loss of his talent and productivity impacted not only upon his family and friends, but also upon Australia and indeed the world. While most of the people who die or are disabled (even if for a short time), may not be as famous or as highly specialised as Dr Chang, for each and every death or permanent disability that person's cessation of

productivity and their future potential is impossible to factor. This cessation not only affects tangibles such as productivity but also intangibles such as morale, loss of goodwill, lack of motivation. In Dr Chang's case - who are the people he will no longer be able to save or train, and what will be their subsequent loss of productivity and the resultant impact?

2.3 Manual Handling Statistics

Manual handling injuries directly cost Australia up to $1 billion per annum (Anonymous:1994 b), and most result in some form of musculoskeletal injury (Mahone 1994; Worksafe 1994 b). While so many workers' claims are due to manual handling, it must continue to be addressed as an issue.

It is not possible to accrue the current cost of W.C. injuries without some formidable statistics. The back is the most often affected body part in manual handling (Worksafe 1994b), and this is where the majority of literature is centred. It has been estimated that some 80% of adults will - at some point in their working lives - experience back pain that affects, or is the result of their work (Zwerling et al 1993). Most back injuries affect the 30-40 year old who is in their most productive work period (Shi 1993). Not all people with back aches will be involved with manual handling, but one third of all W.C. claims are associated with manual handling (Mahone 1994). In Australia a staggering 46% of all W.C. injuries result in some form of muscle sprain and/or strain (Worksafe 1994b). Areas most often affected are the back (25%), followed by the lower limbs (20%) arms and shoulder (15%) and then hand and fingers (14%) (Worksafe 1994 b). When you consider that a recent Worksafe survey that found only 47% of people claimed W.C. for their work related injury or disease (Worksafe 1994c), the prevalence of injury from manual handling could be substantially worse.

There are three studies in the US which researched employee medical screening as a possible pre-employment indicator to employees developing work-related back injuries (Zwerling et al 1993). They showed that where there was a history of previous back injury or, where there was an existing disability (the example given was that of a veteran), the incidence of injury to the back was higher. One finding of these studies was that females and younger workers have a higher incidence of back injury. However a further study by Zwerling (et al 1993), found that pre-employment medical screening was not accurate in predicting the development of work-related employee back injury.

The incidence of documented body stressing injuries continues to escalate (Table 2.3.1.), even though there is an ever increasing focus on O.H.&S. since the mid 1980s. This is not only true for the overall incidence of injury but also in the areas of musculoskeletal injuries such as body stressing and back injuries.

Table 2.3.1. Workplace Injuries

Incidence	90/91	91/92	92/93	93/94
Workers injured	20/1000	19/1000	18/1000	19/1000
Body stressing	nearly 1/3	over 1/3	36%	37%
Back Injury	over 25%	30%	30%	31%

Source WorkCover Authority NSW statistical branch

A US study of 4 States (Jensen cited in McAtamney & Corlett 1992) found that of the top 7 occupations experiencing back injuries due to manual handling, 4 were associated with nursing and patient care. The staff at Wattle St SSP have similar roles to that of nursing staff. McAtamney & Corlett (1992) cite that nurses handle patients during toileting, positioning, bathing and showering. These tasks are identical for the staff of Wattle St SSP staff (Chapter 1.6). Both

professions spend time manually handling people and as a consequence their backs are often in a bent and/or twisted load bearing position.

Within the South Coast Region of the DSE between 1991 and 1994 the average incidence of workplace injury in the area of musculoskeletal sprains and strains is 131 per fiscal year. The average direct cost over the same time period is $ 320 897 per fiscal year or approximately $2450 per incident (DSE Workers Compensation Statistics 1990/91, 1991/92, 1992/93 and 1993/94).

2.4 Benefits of a Safety Program

The most obvious benefit of an effective safety program (to an employer) is the $ savings. The Du Pont organisation believes that every day off for an employee costs them $13 000 (Matthes 1992a). Therefore, for every day 're-claimed' through effective safety programs that is how much money is saved, or the amount of waste reduced (Kerr & Vos 1993). Further company benefits of safety programs claimed by its proponents include such things as:

1. Improved efficiency and productivity. Effective safety programs allow experienced staff to perform their jobs well. Programs may target hardening of the muscles (Gunsch 1993), improving general levels of cardiovascular fitness (Kerr & Vos 1993), early intervention to reduce time off work for an injured employee (Matthes 1992 a), or introducing stress management and meditation (Cacioppe & Samson 1986).
2. Increased job satisfaction. Experiencing less pain resulted in a 9% increase in job satisfaction in one study in America (Shi 1993). A program aimed at reducing the frustration of employees could target such aspects as lighting, work stations, and appropriate furniture and equipment. "Employees come is all shapes and sizes so it is important to customise

workstations" (Matthes 1992 b:4). Again stress management and meditation can have very beneficial results and impact upon the whole organisation (Cacioppe & Samson 1986).

3. Decreased absenteeism & job related illnesses. Increasing the level of staff fitness reduces the reason for involuntary absences from work (Kerr & Vos 1993). The incidence of hypertension and coronary heart disease in Australia is too high and would be reduced through general fitness programs (Cacioppe & Samson 1986). Where the absence is due to poor lighting or workstation design, an ergonomic redesign would result in reduced eyestrain, and fatigue. Therefore more staff would be at work (Matthes 1992b).
4. Healthier staff. If staff are exercising then they are healthier, and research has shown that they are less likely to experience back pain (Shi 1993).
5. Improved staff morale. Programs that assist the employees' health and safety builds trust between them and their employers.Through programs of stress management and physical fitness employees are happier and more satisfied with life and their sense of well being. This impacts positively upon workplace morale (Kerr & Vos 1993).
6. Decreased staff turnover. As the staff are happier, healthier and more productive at work, they are less likely to leave or look for other work (Kerr & Vos 1993).
7. Decreased litigation. By using a proactive approach to decrease the risk of an accident or disease, a safe workplace (as per legislation) is created. As a result employees are less able to sue their employer (Brief 1989).
8. Increased interpersonal relationships,co-operation and adaptability to change . Techniques to manage stress lead to an increased ability to deal with interpersonal conflict. Staff are, as a result, more willing to co-operate and adapt to change. They may also become more creative (Cacioppe & Samson 1986).

In America one organisation spent $60.4 million on a Hepatitis B vaccine program. They estimated it to be cost effective if it stopped hepatitis B in one or more workers per 6500 per annum (Mauskopf et al 1991). Other organisations believe it to be more cost effective to spend money on employing staff such as therapists, doctors, instructors, and providing fitness equipment, (Gunsch 1993), than to have employees absent, or not working at their peak.

While research is rich with literature about the organisational benefits of effective safety programs, the importance of eliminating or reducing pain and suffering to individuals (and their families) was overlooked. This may be a sad reflection on the world or, simply highlights a research gap.

2.5 How to Implement Safety Programs

The literature in this area is plentiful though at times contradictory. All articles except one, stated or inferred the benefit of an effective safety program in the area of manual handling. Shipley (1987) argued that manual handling was being replaced by mechanisation. As such it would not be an area of great concern soon and resources should not be wasted developing strategies for the reduction of manual handling injuries. Time, money and effort should be reserved for mentally stressful occupations such as air traffic controllers who could effectively orchestrate a catastrophe in seconds. Although this article was written some 8 years ago and statistics show neither has yet happened, this thinking is in line with Toffler's Third Wave Theory (Hough 1993 a&b). As the Industrial Era shifts, and some lifting becomes mechanised the incidence of manual handling and ergo its injuries will reduce. Meanwhile, many workplaces still have significant and increasing manual handling injuries and Worksafe continues to target manual handling injury reduction as a priority

(Worksafe 1989 a; Worksafe 1992 b).

Reviewed literature focused on two main categories of intervention strategies.

1. Health Programs
2. Accident and Injury Prevention Programs

Health programs are aimed at improving the general well being of employees without targeting specific work actions. The accident and injury prevention programs look at analysing work places and work practices and are therefore very work specific.

Kerr & Vos (1993) perceive a fitness program as beneficial to all employees across a range of occupations. Their reasoning is that many workers fall into one or more of the following categories: unfit, overweight, and abusers of substances such as tobacco, alcohol, prescription and other drugs, any of which may adversely affect productivity. Proponents of health programs believe this non-work specific approach to be applicable generally, and is cost effective.

Programs may be complex, such as collating and analysing medical data on all employees to provide individual profiles, so that an employee can be given feedback on their progress as they improve their fitness and wellbeing (Cacioppe & Samson 1986). Programs may be simple with companies distributing/ displaying information on healthier lifestyles or sponsoring healthy activities within the community (Zechetmayr 1992). The important factors are to harness employees' interests and talents so as to motivate them to participate (Epes 1994). Some programs advocate a fully equipped gymnasium complete with shower facilities on site (Kerr & Vos 1993), through

to medically testing all employees in the area of cholesterol, aerobic capacity, blood pressure, diet, smoking, and blood tests (La Dou 1975). Recreational activities are included as important factors (Cacioppe & Samson 1986) while others feel it sufficient to survey staff re their lifestyles and include employee's families in the health program (Wachsman & Swanson 1992).

A program designed to make workers healthier in general will have specific benefits to each individual's job. Employee fitness programs should improve productivity (Epes 1994; Kerr & Vos 1993; Shi 1993; Wachsman & Swanson 1992; Zechetmayr 1992; Cacioppe & Samson 1986; La Dou 1975). They may also impact positively on workplace culture (Epes 1994; Kerr & Vos 1993; Shi 1993; Wachsman & Swanson 1992; Zechetmayr 1992; Cacioppe & Samson 1986).

Accident and injury prevention programs look at targeting specific work place practices and designs. Again two approaches were found. One was reactive based on analysing what went wrong (Shipley 1987), or determining the magnitude of a problem (Weber 1992). The second and more emergent approach, particularly in recent literature, was the need to be proactive. Kohn & Friend (1993) Matthes (1992 a&b), Alexander (1986) all recommend an ergonomic approach that fits the job to the worker. Ergonomic assessment looks at the needs of the person, and then focuses on adapting the system to this individual (Alexander 1986).

Kogi (1993 a&b) postulated that effective safety programs required the proactive risk assessment approach to provide a comprehensive, overall strategy. Joy (1993) agrees with this approach as the emphasis is preventing the injury and/or loss. All aspects of the workplace can be analysed through a risk assessment, of which there are two stages. One is where the probability of

an accident/disease is determined. The second stage is where the organisation decides what probability levels are acceptable (Joy 1993). Risk assessment is seen by many as the crucial component of an effective safety program (Joy 1993; Kogi 1993a; Shi 1993; Wachsman & Swanson 1992).

The difference between an ergonomic approach and risk assessment is one of orientation. Both are proactive. Both look at preventing injury or disease. However, ergonomics looks at fitting the job to the worker, whereas risk assessment analysis the potential for harm.

The proactive approach is based upon designing safety into the system (Trautlein & Milner 1994), and advocates frequently recommend incorporating a team approach (Trautlein & Milner 1994; Kogi 1993a; Kohn & Friend 1993; Lanier 1992; McAtamney & Corlett 1992), or employee participation (Joy 1993; Kogi 1993b; Mulray 1992), into the total safety program.

A tool perceived as effective in safety management is teamwork (Trautlein & Milner 1994; Kohn & Friend 1993; Kogi 1993a; Lanier 1992; McAtamney & Corlett 1992). Two separate and distinct ways to incorporate the team approach was found, and both were viewed as successful in implementing effective safety programs. One is where the organisation works in teams and safety is integrated into the work practice, the second is where teams are used to develop safe working practices and systems. Lanier (1992) discusses the former and believes that group peer pressure will result in safer behaviour. This thinking is in line with the view that accidents are the result of poor work habits and practice. A view that was supported by Lanier's research in the US using a company with 200 employees. Trautlein & Milner (1994) discuss the latter. They view teamwork as resulting in synergy and therefore teams need to be cross representational in order to fully understand the safety needs of the

organisation. This view is supported by others (Kohn & Friend 1993; Kogi 1993a; McAtamney & Corlett 1992).

Employee participation is beneficial as each person can provide information about what they consider to be safe and unsafe within a workplace (Joy 1993; Kogi 1993 b; Mulray 1992). It is also important to consider the trend that organisations have towards restructuring. The DSE of NSW underwent a major 5 year restructuring starting from 1989 (Chapter 1.1). August 1995 contained another restructuring announcement. As organisations restructure they tend towards reducing the management levels. Therefore it is more important than ever for employees to be part of the safety process (Roughton 1993 b).

Health programs also featured in the specific area of manual handling, but as part of the accident and injury prevention programs. This could be due to a perception that manual handling injuries arise as a result of unfit employees (Genaidy et al 1994). Proponents advocate activities that include 5 minutes of group exercises prior to work (Gunsch 1993), to training and development on all aspects of healthy lifestyles (Shi 1993). The use of daily stretching and strengthening of muscles is considered valuable (Genaidy et al 1994; Feldstein et al 1993; Gunsch 1993). Many perceive some form of employee exercise program as beneficial in strengthening and increasing the flexibility of muscles to enable lifting and therefore reducing the likelihood of resultant injuries (Genaidy et al 1994; Feldstein et al 1993; Gunsch 1993; Shi 1993;).

Within the reactive approach to manual handling injuries Shipley (1987) discussed the need to analyse the reasons why the injury occurred. Also highlighted was the need to look at relevant antecedents, to determine if anything interfered with the manual handling process. Roughton (1992)

suggested a statistical approach whereby activities and injuries were charted onto a pareto graph which could then be task analysed in an effort to identify root causes and then alter procedure and resultant behaviour accordingly.

Risk assessment in manual handling was advocated by Mahone (1994), and Shi (1993) advocated both a risk assessment and employee exercising program. By conducting a risk assessment not only are employers complying with the manual handling regulation, but they are also looking beyond the immediate problems and into the preventative approach.

In the area of manual handling it is mandatory to conduct a risk assessment (Worksafe 1990a; O. H. & S. [Manual Handling] Regulation 1991) in NSW. Assistance in conducting a risk assessment is provided within the "National Standard for Manual Handling : National Code of Practice" Booklet (1990 a) as well as within Worksafe Australia's Manual Handling information booklet (1992 a) through the provision of a general manual handling checklist. As well, the WorkCover Authority of NSW inspectors can provide assistance (WorkCover 1994 a).

Obviously each organisation's safety needs are unique. An organisation's preexisting culture may determine their safety program approach (Gunsch 1993). Newer companies may find the proactive risk assessment approach easier to implement as there is no history of injury/illness for them to resolve. They may also have the availability of the necessary modern ergonomically designed machinery. Each organisation needs to determine its own needs and safety infrastructure, within legal and organisational mandates.

2.6 Manual Handling

The Manual Handling National Standard section 4.3 (WorkCover:1994a:8) states a risk assessment be conducted using the following 14 factors:

> "actions and movements ; workplace and workstation layout; working posture and position; duration and frequency of manual handling; location of loads and equipment; weights and forces; characteristics of load and equipment; work organisation; work environment; skills and experience; ages; clothing; special needs (temporary or permanent); and any other factors considered relevant by the employer, the employees or their representative(s) on health and safety issues."

Furthermore Section 5.3 states "The employer shall, if manual handling has been assessed as a risk:

A) Redesign the manual handling task to eliminate or control the risk factors

&

B) Ensure that employees involved ...receive appropriate training"

(WorkCover 1994a:9)

This places the responsibility quite clearly upon the employer. In schools the DSE is the employer and the Principal is the manager at the school level. According to South Coast Regional Office Memo regarding Manual Handling (Ailwood 1995a) it is the Principal who must implement section 5.3.

Is there a correct 'safe' way to lift? Is there a best way to handle manually? WorkCover (1991) and the DSE (Ailwood 1995 b) recommend the traditional (squat) straight back, knees bent lift as being the 'correct' lifting posture. Trafimow (et al 1993) believes there are 2 types of correct lifting techniques. One is called the Stoop Lift. This is where the trunk is not completely vertical, the knees are only slightly apart. It is more of a back lift. The second is the Squat Lift. This is where the back is straight, knees are more fully bent, feet symmetrical and apart, with lowering of the individual to pick up the object. This lift is predominantly executed by the quadriceps muscles and the knees. Since the 1940's the squat lift has been the accepted correct lift. While it would be beneficial to have an illustration depicting the two stances and their differences, none is readily available. The WorkCover Authority and Worksafe Australia publish many articles on back care and manual handling, their focus however is on which positions to avoid and job redesign.

Research shows that the squat lift requires more energy to execute (Trafimow et al 1993), while the stoop lift, or a combination of stoop and squat is more frequently used (Adams et al 1994). What has also emerged is that a study of 'professional lifters' showed that rarely was the squat lift correctly used. When questioned these workers knew the identified correct lift, they simply didn't use it (Kuorinka et al 1994). One reason suggested was that the fatigue of the quadriceps muscles from repetitive lifting meant the individual was less likely to use the pure squat lift (Trafimow et al 1993). Research has also shown that where there is no back injury the back muscles are actually 2-4 times stronger than the leg muscles (Apts 1992). Biomechanical and physiological research has shown that the leg muscles are simply insufficient in strength to always do the squat lift (Kroemer 1992). There is also controversy over whether the stoop or squat lift exerts greater pressure on the lumbar spine (Trafimow et al 1993; Kroemer 1992).

Research provides contradictory information about correct lifting techniques, and the lack of implementation of the traditional lifting method. In other words no one best way to lift has yet emerged.So what can those people required to lift manually do, when improper lifting is cited as the predominant reason for back pain (Apts 1992)?

Dawson (et al 1983) described three approaches to intervening in hazardous situations or practices.

1. Elimination
2. Containment
3. Mitigation

Elimination would mean the cessation of manual handling at the workplace, a solution some nursing employees perceive to be impractical (Larcombe 1993). An approach recommended by McAtamney & Corlett (1992), Larcombe (1993) and Mahone (1994) is to avoid manual handling wherever possible. The DSE in NSW has also suggested the use of mechanical aids where manual handling has been identified as a risk (Ailwood 1995 a). Larcombe (1993) claims that there is sufficient technology to cease the manual lifting of patients. He further states that it is the nurses' responsibility to stop lifting manually as it may put patients at risk. Legislation in the UK (and also in Australia) focuses on the individual's capacity to perform a task, therefore should manual lifting still be required by an employer, then each individual employee should be assessed to determine their physical requirements.

Mahone (1994) believes that while back injuries continue and many organisations implement a 'quick fix' solution of exercising, and training and development on lifting techniques, the real issue is that of job redesign. Manual handling jobs can be modified to reduce risk, or they can be mechanised. All of which would result in the elimination or major containment

of injury as a result of manual handling. McAtamney & Corlett (1992) view manual handling as the last resort. They recommend risk assessment whenever manual handling cannot be circumvented. They also assert that it is important to have a safety program that includes; a safety policy, training on manual handling and the use of relevant equipment, refresher courses, effectiveness monitoring, and good statistical data collection and analysis.

Containment occurs when some action reduces the probability of a hazard occurring (Dawson et al 1983). One method currently advertised in articles dealing with O.H.&S. is the use of abdominal belts. In some organisations they are viewed as an effective aid (Halogen 1992). However, they do present problems. One is that they can be bought through the mail and therefore the person may not purchase the correct one, or even wear it or use it properly (Hilgen 1992). There is also no research to show they have any value other than possibly reminding staff of the need to lift safely (Mahone 1994).

Another frequently employed strategy is training and staff development in correct, safe, manual handling practices (Genaidy et al 1994; WorkCover 1994; Feldstein et al 1993; Gunsch 1993; Kroemer 1992; McAtamney & Corlett 1992; Worksafe 1992a), yet, there is no evidence to show that this traditional approach is successful (Mahone 1994; Kroemer 1992; Qld Nurses Union 1991). Given the controversy that still surrounds the 'correct lift' and the lack of its implementation this is not surprising.

Another containment strategy is strengthening muscles via an exercise program (Barry et al 1993; Feldstein et al 1993; Gunsch 1993; Kerr & Vos 1993; Shi 1993; Trafimow et al 1993; Genaidy et al 1992; Kroemer 1992; Matthes 1992b), and stretching muscles for flexibility (Dolan 1993; Feldstein et al 1993; Gunsch 1993; Genaidy et al 1992; Guo et al 1992; Kroemer 1992;

Matthes 1992b; Kurz 1991; Worksafe 1992b). Logic would decree that the stronger the muscles the better they are able to cope with manual handling.

There are also some proponents of mitigation. Physical trainers are employed (Gunsch 1993) so that when injury does occur they are on site and ready to assist immediately. This early intervention after injury is seen to be very beneficial in accelerating effective rehabilitation (Gunsch 1993; Matthes 1992a).

Mahone (1994) views many of the solutions aimed at minimising manual handling as 'quick fix' solutions. That is because they treat the symptom, without necessarily addressing the real issue - the cause. There is no disputing the fact that muscles are injured. The reason for muscle injury is simple. They were insufficiently strong enough to complete the task without sustaining the injury. Training and development on lifting the correct safe way has also been frequently tried. Given the lack of success with this approach (Mahone 1994; Kroemer 1992; Qld Nurses Union 1991), surely it is time to look beyond the symptom to the underlying cause.

The real issue and need is a thorough job analysis. This involves risk assessment (Joy 1993; Kogi 1993 a&b; Shi 1993; Mulray 1992; Roughton 1992; Worksafe 1992 a), ergonomic assessment (Kohn & Friend 1993; Fragala 1992; Kroemer 1992; McAtamney & Corlett 1992; Qld Nurses Union 1991; Worksafe 1989a; Alexander 1986), job redesign (Mahone 1994; Larcombe 1993; Fragala 1992; Matthes 1992b; Qld Nurses Union 1991;), cost benefit analysis (Fragala 1992), monitoring, measuring, evaluating (Mahone 1994; Fragala 1992), and process hazard analysis (Roughton 1993 a).

More research in needed in the area of manual handling. The controversy

over the safest lifting position/method needs to be definitively resolved. While anthropometric assessments may be considered costly and impractical, they may provide crucial information in determining each individual's musculoskeletal capability in relation to manual handling. Research in this area may provide valuable empirical information, that results in staff not attempting to manually handling beyond their capabilities. Conversely, it may be much easier to regard all 'patients' as being too heavy to lift (Larcombe 1993). There is currently insufficient research on the effects of 1 muscle overload instance and cumulative trauma (Brinkman et al 1994).

Currently in Australia some two-thirds of back injuries due to work related claims are associated with manual handling (Mahone 1994). Injury due to manual handling is still increasing (contrary to Shipley [1987] and Hough [1993a]) - despite it being targeted as a priority by WorkCover here (Worksafe 1989a; Worksafe 1992b), as well as overseas (Larcombe 1993; Genaidy et al 1992). Therefore a comprehensive approach is needed. (Trautlein & Milner 1994; Joy 1993; Kohn & friend 1993; Roughton 1993b; Shi 1993; Kogi 1993 a&b; Fragala 1992; McAtamney & Corlett 1992).

WorkCover launched its five year 'BackPak' program in November 1994 in recognition of a national need to reduce the incidence and severity of back injuries due to manual handling. Targeted were occupations where manual handling had resulted in significant back injuries (WorkCover 1995). This program is offered through "BackWatch" seminars in capitol cities as well as across regional centres. The program's premise is that most back injuries can be prevented, and acknowledges that most of these injuries are the result of cumulative strain. It provides practical help in identifying, assessing and controlling manual handling activities to reduce employee injuries (WorkCover 1995).

Certainly an environment such as Wattle St SSP with an existing record of injury needs to address those issues - why do injuries occur and how do you stop/minimise it. However, this is still a reactive approach focused on analysing what happened and instigating measures to ensure that it does not happen again. A proactive approach uses risk assessment, ergonomics, redesign of physical systems and work practices, and continuous improvement. It looks at identifying the potential for harm before damage occurs, and taking the necessary steps to ensure that no-one in involved in a work related injury or develops a disease.

Lamm (1994) states there are suggestions of T.Q.M. approaches in effective safety management. Reasons cited for this include T.Q.M.'s preoccupation with continuously improving every facet of an organisation. This aligns itself nicely with risk assessment and ergonomic analyses. T.Q.M. is concerned with a customer focus - both internal and external. Safety is internal employee (customer) oriented. Both are embedded in problem solving, continuous improvement, teamwork, and the process (Imai 1986).

2.7 Individual Characteristics and Manual Handling

Gender and age emerge as significant factors within the area of manual handling. In terms of muscle strength women possess between 35%-85% compared to males with similar training (Nyland & Kelly 1992). Not only do women have less muscle strength, but muscle systems are different across the genders and therefore women use their muscles differently (Nyland & Kelly 1992). Larcombe (1993) suggests that 2 females lifting together should not lift a load greater than 33 kgs, and depending on the fitness and training of the individuals the load may be as low as 22kgs.

Age is also an important consideration. Initially this affects those under 18 years as their muscles are not yet fully developed and therefore their risk of injury is greater (Worksafe 1992a). As we age, some physical changes are detrimental to those employees who role includes manual handling. In the central nervous system the mass of our brain decreases, as does the number of neurons we possess and our motor responses, such as reflexes, slow down. During respiration our lung vital capacity is reduced and therefore less oxygen flows into our circulatory system. In the area of manual handling though, the most important concerns are within the cardiovascular and musculoskeletal systems. As we age muscle mass decreases, osteoporosis risk increases (particularly in post menopausal women), there is a decrease in the muscle fibre length together with a loss of elasticity in the connective tissues. All of this translates into a higher risk of muscle injury for aging workers. Lastly there are cardiovascular changes. For many there is an elevation of blood pressure (both systolic and diastolic), an increase in cholesterol production, heart rate and cardiac output (Barry et al 1993).

The important questions are :

When does all this happen?

Does it happen to everyone?

Does all of it happen?

Is there any intervention that can reduce/minimise or even stop this occurring?

It is well known that the onset of menopause increases the risk of osteoporosis and heart disease in women. What is not as well known is that it may also adversely affect muscle density and flexibility as well (Timiras 1994). In Caucasian women the median age for menopause is between 49 and 51 years (Merry & Holeman cited in Timiras 1994; Coney 1991). However, there

are women as young as 35 commencing menopause although it may be another 10-12 years before it is complete (Coney 1991).

In humans, muscles are considered to be at their peak somewhere between the ages of 20 and 30 years (Timiras 1994). While there is some research to suggest that muscle deterioration commences between 25 and 30 years (Qld Nurses Union 1991), it is also important to realise that this deterioration is relative to the initial standard. A person may notice the changes in themselves from when they were 20 or 25 years old. However, a fit and healthy 50 year old could easily be fitter and healthier than an unfit 25 year old. While exercising is considered to be important at all ages, its importance increases markedly with age (Timiras 1994; Coney 1991).

The level of psychosocial and organisational stress experienced by an employee may also impact upon their work practice. An overly stressed individual is less likely to adhere to procedural guidelines and practices (Griffiths 1994). There are many reasons for high stress - which may or may not be work-related. However, it is crucial to determine root causes (Shipley 1987). Insufficient time (whether real or perceived) to complete tasks at Wattle St SSP could generate stress.

An individual's flexibility may also be an important consideration. Feldstein (et al 1993) found that the more flexible a person was, the less back pain they experienced. Flexibility is achieved by gentling stretching muscles so they can extend up to 130% of its resting length (Kurz 1991). It improves the blood flow to the muscle and not only prepares the muscles at the beginning of lifts, but at the end some stretching helps the muscles to recover and harden (Gunsch 1993; Kurz 1991). Dolan (1993) found that the more flexible an individual the less bending stress they experienced when lifting.

There has also been some research into the relationship between job satisfaction and personality to work related injury and disease. While Levoska and Kiukaanniemi (1994) found that there was a positive correlation between job dissatisfaction and back pain, Spillane and Spillane (1994) found no correlation between personality and work related illness and disease.

An emergent characteristic relates to an individual's literacy level and their subsequent ability to understand currently available O.H.&S. literature. While there is sufficient documentation from WorkCover that relates to manual handling, such as the legislative requirements (1994a), treatment and services (1994b), and preventative measures an employee/ organisation can take (1991), most of this documentation requires significant reading ability. A study in the US found that most O.H.&S. material required a reading age of college level with only 16% of material at or lower than that of a grade 8 student (Jenner 1994). Many educators believe that the average reading age of Australians is currently that of a 12 year old - or a Year 7 student. The challenge is then for organisations to translate relevant information either into diagrams or pictures with simple directions to ensure that comprehension is not a barrier to safe work practice. This is especially important where there is a significant proportion of staff who speak english as their second language.

2.8 Total Quality Management

Much has been written about Total Quality Management and there are many corporations employing T.Q.M. to improve productivity and (possibly) their global competitiveness (Paine et al:1992). Information on what constitutes T.Q.M. is somewhat contradictory and confusing at times (Lischeid & Leary 1994). One reason for this is that T.Q.M. is an emergent paradigm. While the Japanese have employed Total Quality Control (TQC) methods since the

1950's, the philosophy and strategies of T.Q.M. have only relatively recently enveloped pockets of the globe. T.Q.M. is concerned with quality, and its application may vary across organisations dependent upon whether they are primarily industry or service based. It is still possible to argue about what constitutes T.Q.M. However, after extensive reading in the area the following principles and practices are offered as the generic basis of T.Q.M.

Key Principles

1. Customer Focus (Dawson & Palmer 1995; Dean & Bowen 1994; Lischeid & Leary 1994; Spencer 1994; Crosling & Munzberg 1993; Hough 1993 a&b; Bostingl 1992b; Fraczek 1992; Macchia 1992; Paine et al 1992; Swiss 1992; Boyapati 1991; Chapman 1991; Kaufman 1991; Rocheleau 1991; Dimock 1990; Blakemore 1989; Deming 1986; Crosby 1980;). All people within an organisation are the internal customers while the external customers are those who supply the raw product, or purchase the final product. In a school system the internal customers are the students and staff, the external customers are the parents, the local community, other schools and departmental services.
2. Continuous Improvement (Dawson & Palmer 1995; Dean & Bowen 1994; Krause 1994; Lischeid & Leary 1994; Peterson 1994; Spencer 1994; Crosling & Munzberg 1993; Hough 1993 a&b; Bostingl 1992b; Grindrod 1992; Lindahl & Leary 1992; Macchia 1992; Pain et al 1992; Roughton 1992; Swiss 1992; Boyapati 1991; Hames 1991; Walton 1991; Jones 1989; Deming 1986; Imai 1986; Crosby 1980). This means that there is an emphasis upon improving the product, solving problems, by looking at the process. Some techniques in use are statistical analysis (Deming 1986; Imai 1986), quality circles (Imai 1986), groups/teams using such techniques as Plan Do Check Action (P.D.C.A.) cycle (Imai 1986), whereby a continuous system of analysis and action are combined with the impetus

of planning and monitoring.

3. Process Orientation (Krause 1994; Caudron 1993; Hough 1993 a&b; Bostingl 1992b; Macchia 1992; Paine et al 1992; Saunders 1992; Blakemore 1989; Deming 1986; Imai 1986; Crosby 1980). The rationale is that if the process is improved then the product is also improved. Deming believed it was impossible to inspect quality into a product, it had to be built into the process (1986).

Some of the practices that support these principles are:

1. Teamwork (Dean & Bowen 1994; Lischeid & Leary 1994; Spencer 1994; Crosling & Munzberg 1993; Fraczek 1992; Lindahl & Leary 1992; Paine et al 1992; Sanders 1992; Siu 1992; Melvin 1991; Deming 1986; Imai 1986; Crosby 1980). This utilises the skills and talents of all employees and results in synergy.
2. Constancy of Purpose (Krause 1994; Spencer 1994; Paine et al 1992; Walton 1991). Everyone must share the same vision and purpose, and work towards the same goal.
3. Elimination of Waste (Krause 1994; Crosling & Munzberg 1993; Paine et al 1992; Roughton 1992; Walton 1991; Deming 1986). All O.H.&S. is viewed as waste - of personnel, time and property. This also includes aspects such as variation in product as well as product and system error.
4. Flexibility (Hough M 1993 a&b; Rocheleau 1991; Dimock 1990). Organisations must be ready for the changes that technology and the 21st century will bring. With the advent of Toffler's 'Third Wave' (Hough 1993 a&b) flexibility and changeability is a crucial organisational factor.
5. Statistical Process Control (Deming 1986; Imai 1986; Paine et al 1992). This is a quantitative way of analysing data as opposed to an ad hoc approach. It is valid and reliable.
6. Staff Empowerment (Dean & Bowen 1994; Spencer 1994; Roughton

1992). By empowering staff they will acquire ownership of the solution and as all employees are concerned with their own health and safety, it is bound to lead to success. No longer are staff asked to leave their brains at the door. They are being acknowledged as an integral component of the whole organisation with skills and knowledge that are beneficial.

2.9 T.Q.M. and Safety

Lamm (1994) reported that there are some organisations which see the interrelationship between T.Q.M. and safety. As a result they are employing the aspects of teamwork, process orientation, continuous improvement and statistical process control effectively. One organisation - Sydney Electricity - won a national quality award as a result of their safety improvements. The company attributed their success directly to the implementation of T.Q.M. at the organisation. Lamm further mentions that many Australian companies are reducing the number of accidents or near misses due to the organisations' implementation of T.Q.M. and/or ISO 9000 (which Lamm sees as a T.Q.M. derivative).

Lindahl & Leary (1992) reported on the success that USA's Federal Express has been experiencing due to its implementation of T.Q.M. principles and strategies in the area of safety. This organisation implemented the strategy of continuous improvement in safety across its 70 000 employees through a spiral process similar in orientation to P.D.C.A. Each year all employees complete a safety survey. This is then analysed by work groups who also have the responsibility of developing tangible methods to improve upon these safety concerns. Employees are recognised as pivotal to the success of the program. Not only are they in the best position to perceive the safety problem, they are also the ones with the solutions. Through this approach employees

are not only highlighted as being crucial to the organisation, they are also acknowledged as being skilled and talented. As a result the staff are empowered, and the whole organisation has a constancy of purpose. Management is involved in monitoring and motivating the process. The strategies are seen as successful. Safety has improved and resources are used more cost effectively as a result of successfully targeting concerns, and all employees have ownership. Through the success of T.Q.M. strategies in the area of safety the organisation is now looking at extending the process into other areas of Federal Express.

Sommerkamp (1994) looked at T.Q.M. within the construction industry in America. Safety in construction is crucial. A shift in attitude amongst contractors was identified as the first step. Employees needed to be seen as assets, with employers realising the benefits of treating them as valuable internal customers. Management is learning how important it is for everyone in the organisation to share the same vision and purpose, that it is actually counterproductive to have factions at cross purposes. In order to achieve this a shift in management thinking was required. No longer was it acceptable to blame workers for substandard work, particularly when tradespeople were supplied with equipment that was substandard. Sommerkamp discusses an American organisation where management were concerned with safety and expecting improvements without really knowing how to achieve it. Eventually a project safety analysis was conducted to highlight areas of concern. This statistical analysis provided accurate information and pinpointed pathways for improvement.

Petersen (1994) believes there is a natural fit between T.Q.M. and safety management, to the point where organisations employing T.Q.M. will make their safety professionals obsolete. He sees the traditional approach to safety

as eclectic and fragmented in nature. T.Q.M. however, is a whole organisational approach, proactive in manner. He points out that while the T.Q.M. approach is vastly different to the traditional safety approach, the utilisation of T.Q.M. is very appropriate for effective safety within an organisation. Petersen believes that Deming's 14 points (1986 : 23-24) are most suitable for translation into safety obligations (Appendix D). Traditional safety programs - which are reactive and seek blame, do not work, therefore for safety to be truly effective it must be integrated into the whole organisation. He advocates T.Q.M. as the best way to effectively combat safety problems.

Krause (1994) also uses Deming's 14 points to demonstrate the relationship between safety and T.Q.M. and develops his own 8 principles as a result (Appendix E). He also cites the importance of employees working together toward the same outcome. Krause believes that traditionally organisations have implemented short term safety programs that start and then finish. This approach he asserts is ineffectual. An ongoing process of continuous improvement utilising statistical process control is what is really needed. Krause perceives safety and quality to impact upon each other in a positive complementary manner, "...they tend to reinforce each other" (p51). Gains in safety improve upon quality, quality practices result in safety. The two are irrevocably interrelated. Management practice and attitude are also considered important and it is time for them to stop 'blaming' an employee for an injury and look to the underlying systems issue. As a result, should an injury occur management's course of action is to investigate the system not the employee.

Lischeid & Leary (1994) also links safety to quality as both are concerned with improvement. The T.Q.M. strategies of statistical process control (S.P.C.) and maximum utilisation of employee skills and abilities enables more accurate

safety data to be collected, and acted upon. T.Q.M. requires a culture shift to establish a culture responsive to change. This is also the culture required for effective safety management as there is often a need to alter work practices and work systems. The key to achieving all of this lies in education. Employees need educating in the T.Q.M. strategies, while management requires education to alter their thinking to become more lateral rather than traditional.

Trautlein & Milner (1994) believe that safety management is undergoing a paradigm shift. Safety is successfully being integrated into organisations through the use of teams and continuous improvement. Safety is being addressed in a proactive manner and as a result workplace culture is changing.

Some key organisations such as BHP, Du Pont, and Sydney Electricity are successfully beginning to see the role that safety management plays within T.Q.M. (Lamm 1994; Lischeid & Leary 1994; Matthes 1992 a). Firstly T.Q.M. is concerned with a customer focus, or a "people first philosophy" (Lindahl & Leary 1992:13). Within an organisation employees are the internal customers. Within a school, staff (together with students) are internal customers.

Continuous improvement is fundamental to T.Q.M.. In safety programs it is an essential component (Krause 1994). Through an improvement process potential injuries/ diseases may be averted.

The final T.Q.M. cornerstone is that of a process orientation. A process is a course of action (Concise Oxford 1976:883). Safety programs are also a course of action (Krause 1994), constantly seeking out how to improve the system, and work practice. Systems are sets of processes and it is often the

system at fault (Trautlein & Milner 1994).

T.Q.M. advocates teamwork. Some proponents of effective safety programs also recommend this approach (Lischeid & Leary 1994). Trautlein & Milner (1994) believe that through teams safety becomes everyone's concern, not just the immediate supervisors'.

Constancy of purpose is necessary in T.Q.M.. It is also necessary within safety management (Lischeid & Leary 1994). It is not possible for a safety program to be considered effective if management perceives safety to be something that employees are doing wrong, while the employees view safety as something management must fix. In order for any program to be successful it is necessary for everyone in the organisation to perceive the need, process and outcome to be the same (Sommerkamp 1994).

Elimination of waste is not only desirable but within these times of economic rationalisation - a necessity. Deming (1986) says 'doing it right first time' is crucial to the elimination of waste. This is also the essence of O.H.&S (Krause 1994). If work practices and work systems were designed and implemented correctly the first time, then redesign would not be necessary. In the area of manual handling, if tasks were ergonomically designed and mechanisation investigated before a 'load' was handled, then the incidence of injury would plummet, particularly if each employee were considered into the task. Every injury or disease at a workplace results in a waste of time, money, and effort.

Flexibility is important in T.Q.M.. It is also important within manual handling. At Wattle St SSP for instance it is not possible to purchase different equipment for each student, or indeed for each staff members' needs. However, it is possible to purchase flexible equipment. Hydraulic lifts that adjust to the

various heights of students, and adjustable chairs to allow staff to feed students at the correct height and distance, each time, every time are ways of incorporating flexibility into the school system.

Staff empowerment in T.Q.M. utilises staff expertise and interest. Within the construction industry it could mean trade input into tools of sufficient quality (Sommerkamp 1994). This would create ownership and quality. This means that staff are more likely to understand an issue and care about the outcome. It has been said that employees will care about their health and well being above anything else at the workplace. If this is true, then empowering staff in the area of safety programs would result in an organisation reaping all of the benefits listed in 2.4.

Statistical process control (S.P.C.) is a quantitative method which eliminates guesswork and facilitates accuracy. At Wattle St SSP it could be the vehicle to analyse the exact type and nature of injury occurring as a result of manual handling injuries. It would eliminate the 'gut feeling' and provide employees with the facts.

2.10 Role of Management

In the early 1970's the role of management in O.H.&S. was perceived by some organisations as ensuring that they lived within the law by monitoring legislation and state plans, as well as developing their safety standards (Larry 1973). Preventing litigation is still seen by some as part of management's responsibility (Mulray 1992).

The role of management today is far more consultative then previously (Blewett in Dawson & Palmer 1995). No longer does management singularly

decide how, what, to whom, workers are actively encouraged to participate in the safety process together with management (Blewett in Dawson & Palmer 1995). One of the reasons behind this shift in approach was the introduction of the O.H.&S. Act NSW 1983 where employee participation was regulated via an onsite committee (Section 23 OHS Act; Reg 4 -7, 9). The other main reason was the continued escalation of accidents resulting in injuries and work related diseases (Hansen 1993), and the belief that workers cared about their own health and safety (Kogi 1993 b). Unfortunately, even these changes are not sufficient. One reason touted as an explanation is that the approach is still predominantly reactive and safety is still the responsibility of the safety personnel (Hansen 1993). To be truly effective, safety must be built in (Trautlein & Milner 1994; Hansen 1993; Alexander 1986), and be proactive (Trautlein & Milner 1994; Gunsch 1993; Joy 1993; Kerr & Vos 1993; Kogi 1993 a; Roughton 1993; Shi 1993; Cacioppe & Samson 1992; Fragala 1992; Lanier 1992; McAtamney & Corlett 1992; Mulray 1992; Wachsman & Swanson 1992).

Hansen (1993) identified management's culture as the lynch pin to effective safety management. Management must believe that safety is crucial and act accordingly. They must empower staff (Epes 1994; Gunsch 1993; Hansen 1993; Matthes 1992 a; Mulray 1992), and encourage innovations and use change agents (Hansen 1993).

Organisations often know the extent of their O.H.&S. risks and inform their managements, but do not communicate it to their employees (Cummings 1980). This approach is changing (Appendix JA), with many organisations willing to release their data relating to O.H.&S.

Many of the approaches advocated do not mention T.Q.M.. Given that T.Q.M. is

a relatively new paradigm, this is hardly surprising. However, those organisations that are using T.Q.M. strategies seem to be experiencing success within the area of O.H.&S. (Lamm 1994). There is still a belief that it is management's role to minimise work related injury and disease and that it is the workers who need to be skilled up by management (via training) so that they stop making so many mistakes. The us/them culture appears to be evident still (Quinlan & Bohle 1991).

2.11 Education

As stated earlier the DSE in NSW has continuous improvement and quality as two of its goals (Boston 1995). The South Coast Regional Office of the DSE sent a memo to all Directors of Schools, Principals and Managers re O.H.&S. - Manual Handling (Ailwood 1995 a). This memo states the existence of The National Standard and Code of Practice for Manual Handling. It also stresses the need for schools to conduct risk assessments in the area of manual handling, determining whether the current practice is safe or not. When found to be unsafe, the practice must be redesigned via altering manual handling procedure, training and development in safe manual handling techniques, and utilising mechanical aids. Accompanying the memo are three pamphlets from Worksafe showing how to lift correctly (the squat lift), how to minimise manual handling and how to carry out risk assessments. This clearly embodies the current code of practice on manual handling. Given that only five principals (of 223) are trained in O.H.&S. (Ailwood 1995 b), this still raises some doubts about the ability and inclination of school's to implement these practices.

The compatibility of schools and T.Q.M. is well documented (Hough 1993 a&b; Irwin 1993; Bostingl 1992 b; Paine et al 1992). The focus to date has primarily

been on either empowering students by skilling them with statistical process controls (S.P.C.) so that they can use these skills during work experience (Irwin 1993), or incorporating T.Q.M. strategies into the school's management practice (Bender 1994; Chappell 1994; Schargel 1994; Hough 1993 a; Paine et al 1992) through the use of continuous improvement, teams and S.P.C. Feigenbaum points out the need for Total Quality to be a process that starts with young students and continues throughout their schooling to equip them for life after formal education (1994). The area of T.Q.M. compatibility with safety programs in schools has not been well researched to date.

The management of schools has undergone dramatic change in the past few years. The Principal's role now encompasses that of Human Resource Manager, Finance Manager, Physical Resources Manager as well as overseeing quality curriculum development and implementation together with community interaction and collaboration (Cranston 1994). Schools are accountable through continuous in-line management (via Director of Schools), and Quality Assurance reviews every fourth year. The Principal is not only the head of the school but the link between schools and Head Office/Regional Offices. For all this they are still part of a sometimes prescriptive centralised system (Cranston 1994).

Schools have long focused on the needs of their students as internal customers (Chappell 1994), what they have not focused on as well, are its other internal customers - staff. All too often the school environment is geared towards students with staff fitting in. Preschool teachers sitting on tiny preschool chairs (Whitebrook 1983) or staff lifting, positioning students 10-20 times a day and stretching, twisting and turning themselves because the equipment was designed for students' musculoskeletal needs, not staff needs.

2.12 Summary

Legislation since the mid 1980's states quite clearly it is responsibility of the employer to provide a safe workplace and to ensure safe work systems. Traditionally this has occurred with management providing training and development on how employees need to 'do' things safely. This approach has not resulted in reduced injuries and diseases at the workplace. In fact the incidence of injury and disease is still escalating. Total costs are currently estimated at between $15 and $37 billion per fiscal year. In the same time frame the direct costs associated with manual handling are estimated at approximately $1 billion.

Intervention programs have been recommended as a way for organisations to reduce this human and physical waste. The two prominent approaches currently advocated are:

- Healthy lifestyle - fitness programs
- Accident / injury investigation programs

Proponents of both say that the results are encouraging and recommend implementation into other workplaces. Within these two approaches are two distinct strategies. One is reactive, the other proactive. Recent literature suggests proactive measures are more effective and concerned with fitting the job to the worker. This is in line with the 'National Standard for Manual Handling 1991' Code of Practice. The literature continues to discuss the benefits of such strategies as risk assessment, ergonomics assessment, and job redesign to name a few.

A new proactive approach encapsulating the philosophies and strategies of Total Quality Management (T.Q.M.) has been suggested by some authors. No longer is it simply management's role to determine acceptable levels of injury, and develop safety programs. There is now compelling evidence to suggest that an approach empowering employees and using teams to :

Stop and Analyse

- work practices,
- work systems
- and ask 'how can this be improved?'.

will result in those organisations saving money, and improving their productivity and workplace culture.

In the area of manual handling the above issues are just as pertinent. The incidence of manual handling injuries is still escalating. Many organisations have suggested/implemented an exercise program to increase employees muscle strength and flexibility. While research cites overwhelming evidence to justify these programs and their benefits, it is still not enough. There is controversy over lifting techniques, and there are advocates of abolishing manual handling altogether.

Again a total package of knowledge, understanding and most of all a commitment and ability to change to a proactive infrastructure that is focused on employee participation and continually improving is needed.

T.Q.M. deplores waste and this is what worker's compensation is - waste of human life, ability, productivity; waste of money, machinery and time. T.Q.M. also believes that waste can and must be:

- targeted
- reduced
- eliminated

through monitoring, analysing and change using empowered employees in a synergistic team approach.

Traditional safety programs relied on a fragmented approach, an approach that statistics reveal as not working effectively. What is really needed is a long term commitment to preventing injuries and disease (Mahone 1994). T.Q.M. is currently achieving some sound statistical results using a holistic long term approach.

CHAPTER 3

METHODOLOGY

3.0 Introduction

While there are many different types of research, they generally fall into the two broad categories of qualitative and quantitative.

Quantitative research is based on the scientific method and traditionally uses tangible experiments with separate control and experimental groups. Generally the experimental group has something 'done' to them and the results are carefully monitored and tabulated across both groups to determine if in fact, any changes occur. In order to attain reliability and validity within these experiments all variables must be eliminated and/or accounted for (Cohen & Manion (1985).

Qualitative Research is different in its approach. It looks at people and their actions and through observation and trends attempts to induce a generalisation.

Total Quality Management lends itself to both of these categories of research methodology. Initially T.Q.M. started in industrial organisations where the emphasis was on reducing variation in products manufactured. Research in manufacturing aligns comfortably with the quantitative approach as it is possible to compare (for example) two assembly lines, both identical except for a process intervention on one (the experimental group), and not the other (the control group). Data can then be collected, analysed and synthesised with

conclusions made about the effectiveness of the intervention. Education is not a manufacturing industry, it is a service organisation, where qualitative research is in this instance, more appropriate. This is because we are more concerned with behaviours and interactions, than a measurable product.

Research is a process of collecting and analysing data. The research methods employed were evolved throughout the study. It was initially postulated that a simple intervention strategy to strengthen and prepare muscles would be adequate to reduce the incidence and severity of staff musculoskeletal injuries sustained from manual handling. Literature review revealed that this approach while valuable, was only one facet of a complex issue. One single intervention may reduce the levels of injuries sustained by staff, however, it was more beneficial to address the cause of the problem comprehensively, so that maximum benefits could be realised. The initial unitary approach of improving musculoskeletal fitness levels was insufficient to comprehensively address the complex issue of manual handling injuries and therefore a pluralist approach including risk management was developed.

Literature review revealed the essential components of effective safety management included staff ownership (Spencer 1994; Roughton 1992), teamwork, (Trautlein & Milner 1994; Kohn & Friend 1993; Lamm 1992; McAtamney & Corlett 1992), prioritising O.H.&S. (Kerr & Vos 1993; Shi 1993; Matthes 1992a), and a proactive total approach (Trautlein & Milner 1994). T.Q.M. advocates all of the above components as well as including the need for continuous improvement (Krause 1994; Lischeid & Leary 1994; Peterson 1994; Spencer 1994), and a customer focus (Lischeid & Leary 1994; Spencer 1994;).

T.Q.M. is about a process (Krause 1994; Hough 1993 a&b; Paine et al 1992;

Saunders 1992; Juran & Frank 1990; Deming 1986; Imai 1986), and therefore a methodology that utilises a continuous improvement process was needed. It was also necessary to consider an approach that incorporated workplace culture (Hanson 1993). Ethnographic research is a process-oriented methodology, which allows for the subjectivity of the researcher as well as the participants, and is improvement oriented (Goetz & LeCompte 1984). Action research (Appendix KA) is a process similar in implementation to the P.D.C.A./ Kaizen process and has as its focus a specific problem setting. Action research is also collaborative, participatory, self-evaluative (Cohen & Manion 1985), and relatively well known in educational circles. Action research and T.Q.M. both rely on the involvement of all staff and, incorporate ongoing continuous improvement in a spiral action process.

As Wattle St SSP is an educational setting where some staff are already acquainted with and have used the action research method, it is the one that will be implemented with the school's O.H.&S. committee.

Many approaches to implementing effective safety programs can be found. Within manual handling there are two areas that most research agrees upon : the current cost of injuries is unacceptably high (Mahone 1994; Feldstein et al 1993; Fragala 1992; Genaidy et al 1992; Qld Nurses Union 1991), and an intervention program will help (Mahone 1994; Workcover 1994; Yarborough 1994; Feldstein et al 1993; Larcombe 1993; Shi 1993; Trafimow et al 1993). There is research from America to suggest that in the manual handling industry it is beneficial to initiate exercise classes daily, prior to the commencement of each shift (Gunsch 1993). While these classes are voluntary it is reported that benefits exist and musculoskeletal injuries are being reduced in terms of incidence and severity. Research also highlights the benefits of preparing muscles immediately prior to the commencement of

lifting via stretching exercises (Dolan 1993; Feldstein et al 1993; Genaidy et al 1992; Guo et al 1992; Kroemer 1992; Kurz 1991; Worksafe 1989b).

3.1 Aims and Objectives

3.1.1.Aims

1. That staff who participate in an intervention program aimed at strengthening and warming their muscles prior to lifting will reduce the incidence and severity of their musculoskeletal injuries.

2. Staff will implement a continuous improvement process to continue their pursuit of workplace injury reduction.

3.1.2. Research Objective

To provide Wattle St SSP with a comprehensive synthesis of information sufficient for them to determine the most appropriate manner in which to reduce the incidence and severity of their manual handling injuries.

3.1.3. Desired Outcomes

Short Term (3 months - 6 months)

The initial outcome desired was for staff to take some responsibility for their own health and safety within manual handling by exercising and preparing their muscles prior to manual handling. Exercising would improve muscle conditioning and preparing muscles prior to lifting would aid flexibility and reduce the incidence of muscle overload on a 'cold' muscle. The school had initiated an exercise program that was conducted in school time. Not all staff were free each morning to attend these exercises as they have 2-3 mornings

each week where they are on duty unloading buses, and bus unloading ran concurrent with the exercise classes. However this still left 2-3 mornings each week when staff could attend.

The stretching exercises were to be completed immediately prior to lifting and would take a few minutes before commencement of manual handling sessions.

It was important for staff to consciously think about their actions and how safe these actions are prior to manual handling. This would be achieved through informal and formal discussions with staff about the literature findings as well as the results from their questionnaires.

The school structure already operates within teams and through this approach it was postulated that eventually staff would develop ownership to work together as a proactive team in developing an action plan to reduce the incidence and severity of their manual handling injuries.

Long Term (1-5 years)

Through developing an action plan and using continuous improvement it was postulated that a significant long term outcome would be the reduction in the incidence and severity of musculoskeletal injuries within the school. Once this area was adequately addressed the school could then look at utilising the same infrastructure to continue to address the other O.H.&S. injury and disease areas.

3.2 Research Site

The research was conducted at one DSE School for Specific Purposes in NSW. There are a total of sixty staff members of which 86 % are employed fulltime. Approximately 85% of staff have caucasian ancestry. The school is located within the South Coast Region of the NSW Department of School Education and caters for students assessed as functioning across the intellectually moderate and severe continuum.

3.2.1. Participants

All staff at Wattle St SSP were invited to be part of this research. It was a voluntary undertaking and staff were able to determine their levels of participation. The majority of staff were teachers (57%), either working in classrooms or as non-teaching executives. The next largest group were teachers aides (28%), there were also cleaners (6%), clerical support staff (5%), one general assistant and a part time school counsellor (support services). In total full and part time staff number 60. Approximately 88% of the staff were female. The school attracts the part-time services of some allied health personnel such as occupational therapist, speech pathologist, and physiotherapy staff. While they have input into the school, they are not employed by the DSE. They were however consulted about the research, but did not participate in it.

At the school most manual handling of students is done by classroom teachers (including teaching executives) and teacher's aides (special). They are the staff members who work with the students all day long. There is significant manual handling of equipment by the cleaners and the general assistant. While clerical/office staff, non-teaching executives, and support services personnel are not in classrooms or on playground duty, and therefore do not

have major manual handling as part of their job descriptions, they could be called upon to assist with manual handling at any time. Examples of such instances are: a student suffering a drop fit whilst a staff member passes; assisting with moving students around the school; assisting in-class; demonstrating new equipment; assisting in loading/unloading of buses; and physically restraining students who may be causing injury to themselves and/or others in the playgrounds.

Compared to other DSE Regions the staff in the South Coast Region are reputedly older and more stable in their movements across schools, and this can be seen at Wattle St SSP.

3.2.2 Ethics

All staff at Wattle St SSP were informed of the impending research. Their participation in this process was completely voluntary. No pressure was exerted for their participation, or recriminations presented for their lack of participation. All those who did participate did so at their own level of interest and no privacy was breached. A copy of the final paper and computer discs will be presented to the school for all staff and interested stakeholders to read and discuss. Prior to completion staff received a synopsis based on the results of the literature search, an analysis of their school's injury record, summaries of the two questionnaires, and recommendations. Staff were also part of the decision making process through their elected O.H.& S. committee's action research solution to the problems. All aspects of this research were negotiated with the school executive and the O.H. & S. committee.

3.3 Data Collection - Case Study Procedure

3.3.1 Sampling

As random sampling was not used the results from this research cannot be transferred to all populations. However, the school is a representation of SSP schools and therefore this approach may be valid to trial in other schools of a similar nature, that is, where the students are physically and intellectually severely disabled.

3.3.2 Procedure

The research spanned across a fifteen week period. It was postulated that an initial questionnaire (Appendix F) was needed to elicit baseline data and was developed after information contained in initial literature reviewed highlighted the need for fitness activities, as well as the effects of gender and age on manual handling injury incidence. It was further postulated that staff may be experiencing pain without it resulting in an immediate injury and therefore a checksheet (Appendix G) was developed to monitor this over a four week period. This was then followed by a ten week stretching program (Appendix H), using Worksafe Australia's back care exercise program, to complement the school's exercise program. The final component of the research was the concluding questionnaire(Appendix I). This incorporated a risk assessment (taken from Worksafe Australia), evaluation of the stretching and exercise program, and an assessment of the current levels of manual handling at the school.

While not part of the original research, when it became apparent that the DSE was reluctant to release information pertaining to O.H.&S. injuries, as well as the school's senior management's reluctance to release injury data for scrutiny, it was postulated that perhaps it was unreasonable to expect this

information to be used for research purposes. Therefore twenty NSW organisations were contacted late in the research to see what the current practice was in regard to the dissemination of O.H.&S. data (Appendix J).

The study commenced in April 1995, eighteen months after an occupational ergonomic assessment by two external occupational therapists, and some two weeks after their recommended physical redesigns to toilet blocks were completed. An initial voluntary anonymous questionnaire (Appendix F) was developed for staff, and they had one week between Monday April 24th and Friday April 28th 1995, to complete the 24 questions. Its contents and purpose were explained at a staff meeting where they were able to ask any questions about the research that they felt was relevant or important to them. At the conclusion of the meeting staff were able to take a questionnaire. Included were questions relating to baseline data plus others to ascertain the injury history of the staff currently at the school in an effort to isolate variables across staff who sustained injuries, and those who did not. Also included was provision for the effect of past injuries, and methods needed to rehabilitate themselves to the workplace. Staff were also asked to provide information regarding methods they may employ to prevent injuries, and to rate the success of these methods. Staff were given the opportunity to indicate whether there were any aspects of their job that they considered to be unsafe or physically difficult. Finally staff were asked whether they were prepared to trial some exercise and stretching activities.

As the initial questionnaires (Appendix F) were compiled each one was allocated a numeral from 1-60 and staff selected their questionnaires at random. Thus each staff member participating in the research had their own numeral, only known to themselves. This numeral was written onto the top right hand corner of the 4 week checksheet (Appendix G) and staff were asked

to remember their numeral so that they may insert it into the top right hand corner of the final questionnaire (Appendix I). The purpose of this was to triangulate the information from the three data sources so that trends could be analysed as comprehensively as possible while offering maximum anonymity to the respondents.

A checksheet (Appendix G) was developed for staff to indicate (through a tick) when they experienced work related musculoskeletal pain or stiffness. This was distributed to staff at the same time as the initial questionnaire and was to be implemented between Monday May 1st and Friday May 26th 1995. Areas covered in this checklist were the neck, shoulders, elbows, wrists and back, and included numbness of the fingers. This was to be used for 4 consecutive weeks. The purpose was to determine if staff were experiencing warning signs, as well as focus their attention upon work related pain.

Based upon initial findings in the literature review it was postulated that a stretching program would complement the school's own recently developed exercise program and greatly benefit staff who needed to manually handle. The initial literature findings and the stretching exercises were discussed and demonstrated for staff by the researcher at a formal staff meeting and a handout provided for them (Appendix H). At the end of May staff were asked by the researcher to trial the stretching program for ten weeks, commencing on Monday May 29th through until Friday the 18th of June 1995. In the middle of this ten week period were the school holidays (July 1st through until July 16th). This period stretched across two school terms, one for the last five weeks of term two and the other for the first five weeks of the following term.

At the end of this period (Wednesday August 23rd 1995), the school's O.H.&S. committee met with the researcher and the final questionnaire (Appendix I),

was explained and left for distribution to the staff on the following day (Thursday 24th). The staff at the school were requested to return the completed questionnaire within two weeks (Wednesday September 6th). The emphasis in this questionnaire was upon risk assessment using the Worksafe (1992 a) Manual Handling Checklist. Also included in this questionnaire were general questions about the perceived effectiveness of the exercise and stretching activities. Finally staff were asked to tally the amount of times they manually handled across two days (their heaviest and their lightest) to assess the incidence of manual handling.

In order to determine what external support was available to the school it was necessary to have discussions with Worksafe, Workcover and the DSE Regional Personnel Manager, as well as the Manager of the DSE's Risk Management Unit in Sydney (now renamed the Administrative System Unit).

The school needed to make decisions about how to reduce the incidence and severity of manual handling injuries. As the school had an existing O.H.&S. committee it was decided during discussions with the school's senior management, that this committee was the appropriate vehicle with which to achieve school ownership during a series of formal meetings. After these meetings the committee conducted staff discussion re outcomes and and their implications and determined the next stage. The school's injury records were to be analysed and placed onto a data base for the O.H.&S. committee to use and update in the future.

Discussions re the research, questionnaires, checksheet and stretching program, were initially held on an informal ad hoc basis with the school's senior management as well as individual members of the school's O.H.&S. committee. By August 1995 these meetings were formalised with the

committee on a fortnightly basis (a total of six meetings). At the first formal meeting a summary of literature findings was presented to the committee. At subsequent meetings the results of the questionnaires were presented along with their implications and possible solutions. The mandatory manual handling requirements as set out by The National Standard for Manual Handling (Worksafe 1990 a), and the DSE were discussed along with the support provided by Workcover and the DSE. A strategic approach for the school (Appendix K), together with appropriate data analysis techniques (Appendix L) was presented, and included tools such as Total Quality Management's P.D.C.A. continuous improvement cycle, and Kaizen (Appendix M). The final meeting developed Wattle St SSP's action plan for 1996 using the DSE's recommended approach (Appendix N), all of the information from previous meetings, and a risk management process developed for the school as a result of the research (Appendix O).

Staff were also to be given the opportunity to be interviewed about manual handling at the school (Appendix P). This was to determine staff perceptions about the extent of manual handling injuries, to utilise their abilities re possible solutions, and also to triangulate data from the two questionnaires.

Finally twenty organisations (Appendix J) were contacted about who they disseminate O.H.&S. data to. This was in response to the reluctance of DSE personnel releasing data for the research. The organisations were selected using a mix of T.Q.M. and non T.Q.M. organisations, service and industry, private and public service organisations. The only other criterion for selection was that they were known to the researcher.

3.4 Data Analysis Techniques

Data from the two questionnaires, the checklist, and interviews needed to be analysed so that a total needs analysis could be provided for the school.

Data from Questionnaire One was grouped, explored and analysed using a combination of comparison tables, and histograms. The shape of distributions was examined to see if there were any symmetrical or normal distributions. Two separate bilateral comparison tables were created using the criteria of genders, as well as previous injury history to determine if this revealed any trend. This was used to predict the likelihood of staff sustaining injuries from manual handling. Where possible the mode, median and mean was calculated.

In order to be able to provide this information it was necessary to analyse the extent of current and past injuries at the school (the previous 5 years), as well as near misses where possible. In order to determine the causes of these injuries it was necessary to analyse the agency and mechanism of injury using the school's injury register. As the school is part of a large bureaucracy is was also necessary to establish what DSE support was available to the school, as well as the level of support available through Workcover. This support could be in the form of financial, human, physical and or information should the school not have the resources required to implement changes their needs analysis considers important.

The current practices at the school form an integral part of this analysis and therefore it was crucial to collect data relating to how staff manually handle, what they manually handle and how frequently they handle. This information together with the relevant literature review could then be synthesised and

discussed with the schools O.H.&S. committee for them to decide upon a course of action.

The information from the two questionnaires was analysed to see if any trends emerged. Questionnaire one data was used to compare with literature relating to gender, age, and was compared with the school's injury records to determine the validity and reliability of this information. The analysis will be presented in the form of bar graphs.

3.4.2 Reliability

Reliability of information will be triangulated with information from the school's injury records along with staff interviews.

3.5 Summary

The methodology used in this research is qualitative in nature incorporating the strategies of T.Q.M.. The school is the one to make all the decisions. The role of the research was to collate, analyse and synthesise all of the relevant data available, and convert it into a form readily understandable by the school staff.

CHAPTER 4

RESULTS AND ANALYSIS

4.0 Introduction

The results from the first questionnaire (Appendix F) were analysed to see if the data that emerged verified a high incidence of musculoskeletal injuries at the school. It was further analysed to see if these injuries were in fact as a result of the manual handling of students by staff. It was then compared to literature findings relating to the age and gender of staff and the implications of these factors were explored.

The information from the 4 week checklist (Appendix G), was tabled to see if and how many people are experiencing pain - without it leading to an immediate injury.

The results of the second questionnaire (Appendix I), were used to analyse the implementation level of the stretching program, as well as its perceived value. This questionnaire also incorporated a risk assessment in the area of manual handling. Information from the school's implemented exercise program and its perceived value is also tabled. Finally this questionnaire attempted to quantify the amount of manual handling currently occurring at the school. Inferences are made about this synthesised data.

Throughout the course of this research there were some barriers erected by both the school and the DSE. These barriers and their possible causes are discussed.

The school's injury records for a 6 month period (February - July) are tabled and their injury incidence rate is calculated. This is then compared with the results from questionnaire one as well as the 1994/1995 major injury rate for the school.

4.1 Questionnaire One (Appendix F)

This questionnaire deals with the relevant background data of the staff. They were asked to provide information on their gender, age, job classification, length of service (both at the school and within the DSE), as well as previous work-related injury information.

Of the total staff (60) at Wattle St SSP 38 responded (Table 4.1.1.1) to the initial questionnaire. Informal discussions with some staff members revealed that a small number of staff absent during this week (due to workers' compensation, long service leave, or sickness), did not receive a questionnaire. Not all staff members are currently involved in manual handling and therefore the impetus to participate in the research was not as great for them and a possible reason for the response rate.

4.1.1. Background information

Data were analysed in a number of different ways. Appendix Q represents the raw data. This was then split into bilateral comparison tables of respondents who reported that they had sustained a workplace injury and respondents who reported that they had not sustained a workplace injury, (Appendix R) as well as comparisons across genders (Appendix S).

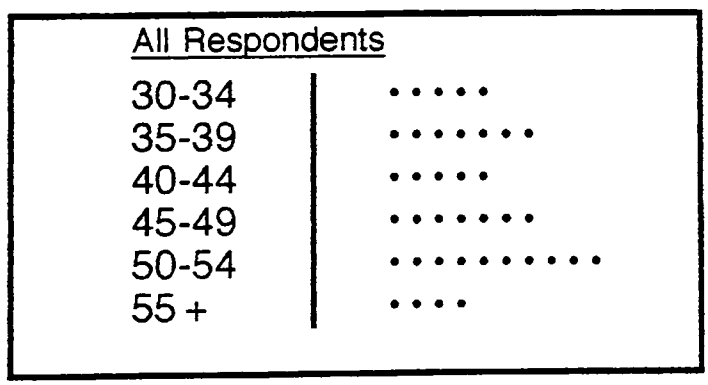
Table 4.1.1.1 Response Rate Questionnaire One

Category	Number	Classification	Max	%Response
A	18	Classroom teacher/ teacher librarian	28	64.3
B	2	Cleaner	4	50
C	1	Clerical/office	3	34
D	2	Executive (Teaching)	4	50
E	2	Executive (Non-Teaching)	2	100
F	1	General Assistant	1	100
G	11	Teacher's Aide (Special)	17	64.7
H	1	Other - Support Services	1	100
Total	**38**		**60**	**63.34%**

Given this is a case study and most categories are small in numbers, respondents generally represented at least 50% of their total population.

An analysis of respondent ages (Table 4.1.1.2) reveals that the mode is in the 50-54 year bracket, the median is within the 45-49 year bracket, and the mean age is somewhere between 43 and 47 years of age. It also reveals that no staff members (who responded) are at their 'muscular peak' of 20-30 yrs of age (Qld Nurses Union 1991), although the school's senior management confirmed that there is one male staff member currently under 30 (thirty) years of age. Furthermore the distribution of the curve is not a normal distribution.

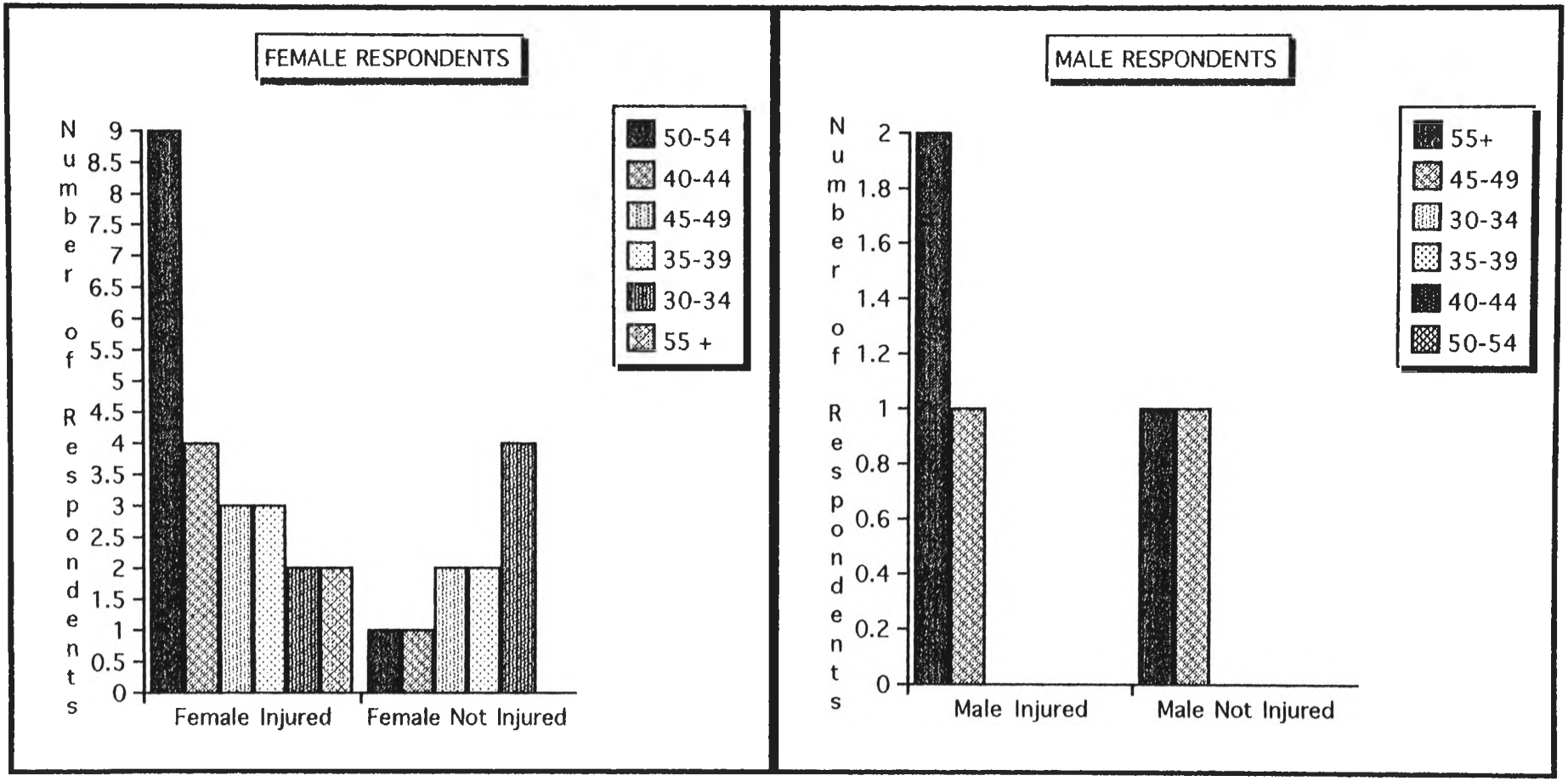
Table 4.1.1.2 Respondent Staff Ages (in years)



WATTLE ST SSP

STAFF RESPONSE TO WORKPLACE INJURY In QUESTIONNAIRE ONE

Figure 4.1.1.1

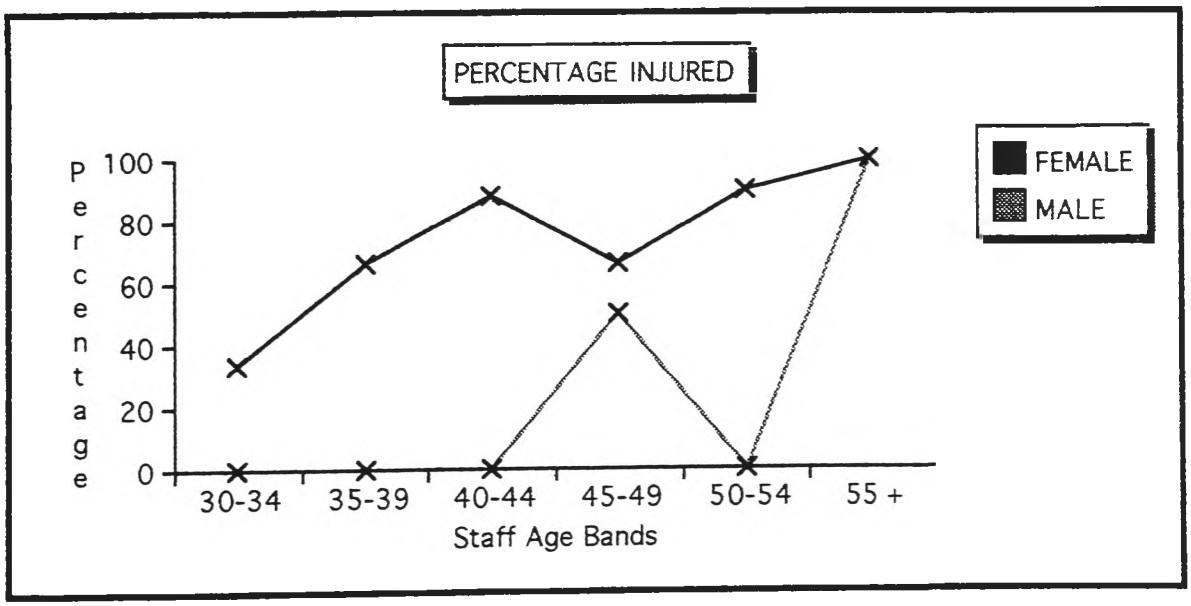


N.B. Legend uses staff age bands (in years) as per questionnaire on

Most of the respondents were female (86.85%) while male respondents totalled five (13.15%). In the total school population (using all of the categories in Table 4.1.1.1) there are fifty three female staff members (88.33%) compared with seven males (11.67%). Therefore, male response rate (71.4%) was slightly better than female response rate (62.3%). A significant proportion of respondents are in the above 50 year age bracket. While this may not in itself indicate anything, there is research to suggest musculoskeletal deterioration in post menopausal women with the current average age of menopause in caucasian women at between 49 and 51 years of age (Timiras 1994).

Figure 4.1.1.1 shows that respondents in all age bands have sustained injuries. It also shows that the older the females the more likely they are to have received an injury. In the 30-34 year age band 34% of female respondents had sustained a work related injury. This percentage increases across most age bands until it reaches 100% in the 55+ age band (Figure 4.1.1.2). Due to the small number of male respondents, no trend is determinable.

Figure 4.1.1.2 Respondent Injury Percentages



Of the 38 respondents, a total of 26 indicated that they had sustained a work-related injury. This of course is for all purported injuries sustained by staff, and does not include when staff were injured, therefore statistically it is invalid. Also some staff indicated that they have been injured more than once. As staff were not asked to comment upon the severity of their injuries, it is not possible to determine how many respondents sustained a major injury requiring them to be absent from their workplace for more than 5 consecutive working days to allow for comparison with Workcover statistics.

Table 4.1.1.3 Average Length of Service (years)

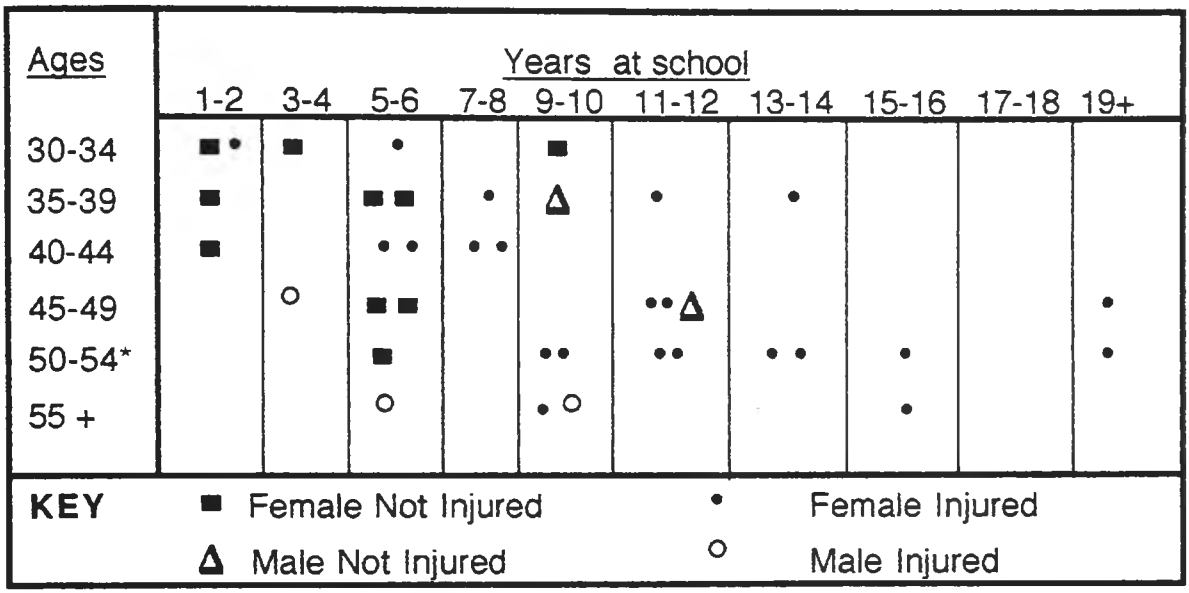
	DSE			Wattle St SSP		
	All Staff	Injured	Not Injured	All Staff	Injured	Not Injured
ALL	14	15.65	11.17	8.76	10.51	5.1
FEMALE	14.42	15.91	11.5	8.88	11.08	3.93
MALE	13	15.34	9.5	7.8	6.34	9.5

Table 4.1.1.3 shows that the average length of service (for staff) within the DSE is 14 years, compared to 8.76 years at the school. The average male length of service within the DSE is slightly lower at 13 years while the female average is slightly higher at 14.42 years and 8.88 years respectively. The averages for injured staff are higher in the 'all' and 'female' category, but not for the male category. Figure 4.1.1.1 shows that of the five male respondents, the two younger ones have not sustained an injury.

In Table 4.1.1.4 a possible relationship between the ages of the female staff together with their length of service at the school is revealed. The incidence of injury is higher as both increase. The results show that the longer the female staff work at the school, together with the older they are, the more likely they

are to sustain a workplace injury. This is in line with Nyland & Kelly's (1992) view that females have less muscle strength than males, and therefore are more inclined to earlier injury, should they be completing tasks of a similar nature.

Table 4.1.1.4 Length of Service at Wattle St SSP



* 1 respondent did not answer this question

Table 4.1.1.5 shows that the majority of respondents have been continuously employed (63%) with child rearing/ maternity leave, the most common reason for non continuous service. Only one male respondent had noncontinuous service and that was attributed to overseas travel. Of those respondents who had sustained injuries, some 69% indicated that they had continuous service within the DSE as compared to 50% of those not previously injured.

Table 4.1.1.5 Continuous Service

	All Staff	Injured	Not Injured
ALL	63.2%(24)	47.4%(18)	15.8%(6)
FEMALE	60.6%(20)	45.45%(15)	15.15%(5)
MALE	80% (4)	60% (3)	20% (1)

Table 4.1.1.6 shows respondent employment patterns. The reasons for these patterns were not sought and are not considered germane to this research. The classification 'teacher' includes the previous categories of executive staff. The table shows that male employees all work fulltime, and most work continuously. Many of the teaching staff (both genders) have worked at other schools. Few teachers' aides (Special) have worked at other schools. All teachers' aides (Special) are female, work fulltime, and have worked continuously.

Table 4.1.1.6 Employment Patterns

Employment	Continuous %		Fulltime %		Other School %	
Classification	Male	Female	Male	Female	Male	Female
Teacher	67%	47.4%	100%	77.8%	33%	63.2%
Cleaner	100%	0%	100%	0%	0%	100%
Clerical/office	N/A	100%	N/A	0%	N/A	0%
General Assistant	100%	N/A	100%	N/A	0%	N/A
Teacher's Aide(Special)	N/A	100%	N/A	100%	N/A	18.2%
Other - Support Services	N/A	0%	N/A/	0%	N/A	100%

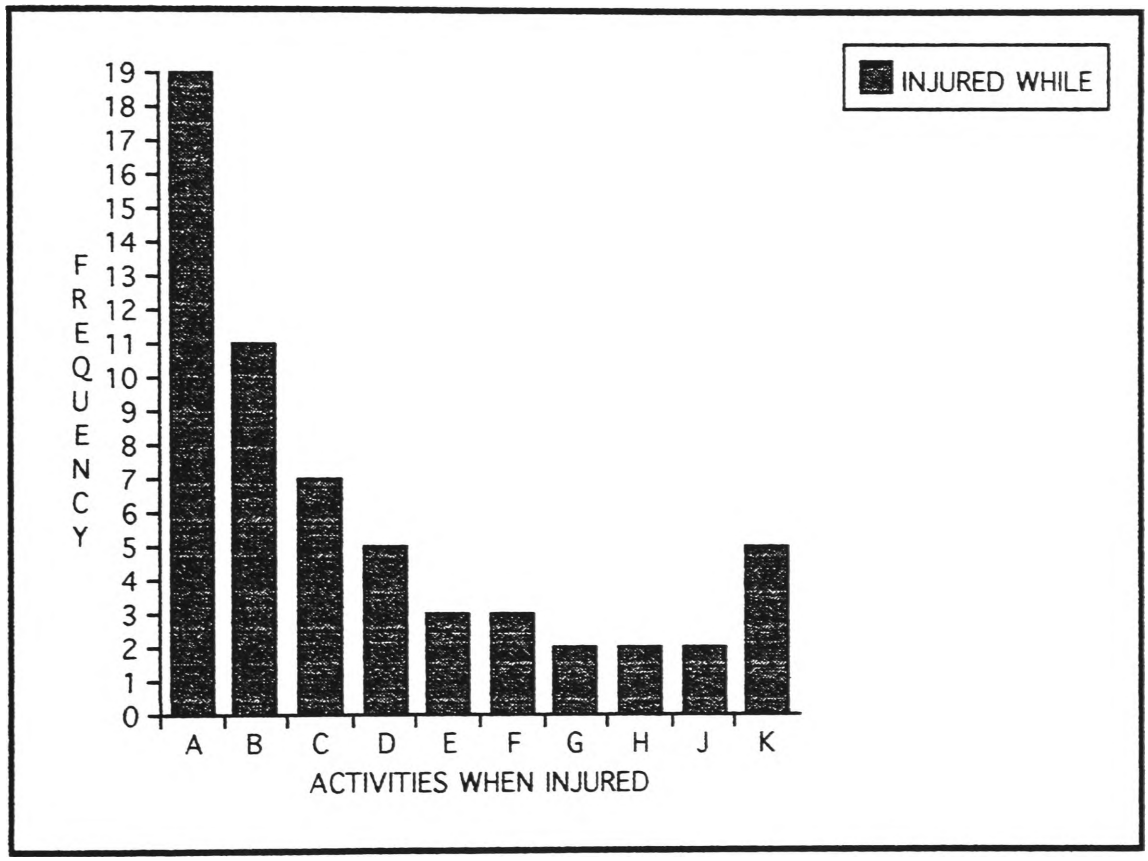
The typical profile of the current staff (using information from the 38 respondents) is as follows:

- Female,
- Employed by the DSE for more than 14 years
- Worked at Wattle St SSP for longer than 8 years
- Continuously employed,
- Works fulltime
- Employed permanently
- Over the age of 45
- Sustained at least one work related injury

4.1.2. Injury Information

Of the staff who responded to the initial questionnaire (Appendix F) 68.4% reported they had sustained a work-related injury. Most of these injuries were attributed to manual handling activities (Figure 4.1.2.1).

Figure 4.1.2.1 Activity When Injury Occurred



KEY:

A Lifting
B Twisting
C Child dropped
D Unloading buses
E Restraining students
F Wheelchairs pushed into you
G Interacting with students
H Positioning
I Putting away/ lifting equipment
J Slipping on floor Uneven surface
K Other

When this data was further analysed into job classifications, it became apparent that all categories except support services personnel (the school counsellor) had sustained injuries from manual handling (Table 4.1.2.1).

Table 4.1.2.1 All Activities

Classification	Injured	Due to Manual Handling	Injured more than once
Classroom teacher/ teacher librarian	10	9	7
Cleaner	1	1	1
Clerical/office	1	1	1
Executive (Teaching)	1	1	1
Executive (Non-Teaching)	2	1	1
General Assistant	1	1	1
Teacher's Aide	10	9	7
Other - Support Services	0	N/A	N/A

It can also be seen from Table 4.1.2.1. that injuries to staff have occurred in almost all job categories, and most (more than 84%) respondents who have sustained an injury have been injured more than once.

Figure 4.1.2.2. Employment Patterns

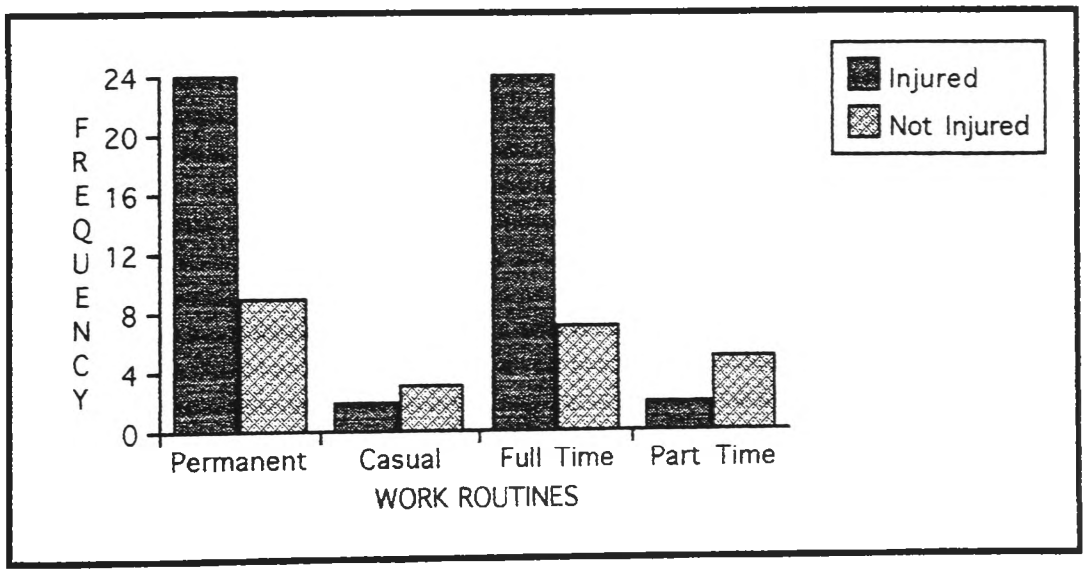
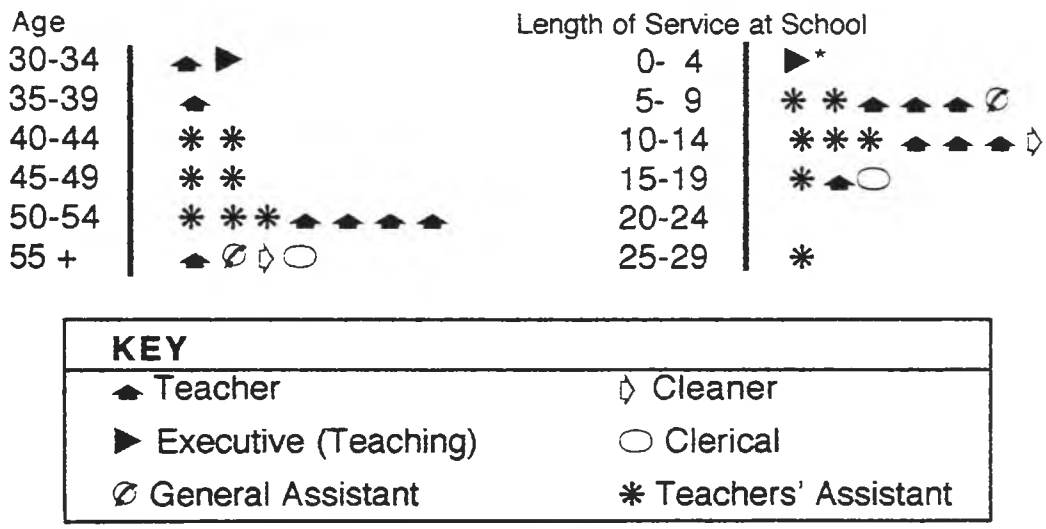


Figure 4.1.2.2 reveals that almost three-quarters (72%) of the permanent staff

who responded have been injured compared to less than half (40%) of the casual staff who responded. Also, approximately three-quarters (77%) of respondents who work fulltime have been injured compared to just over one-quarter (29%) of those who work part-time. Therefore, the length of time that staff work at the school may be a contributing factor to their sustaining an injury.

Table 4.1.2.2 Staff Injured More Than Once Due to Manual Handling by Age and Length of Service at the School

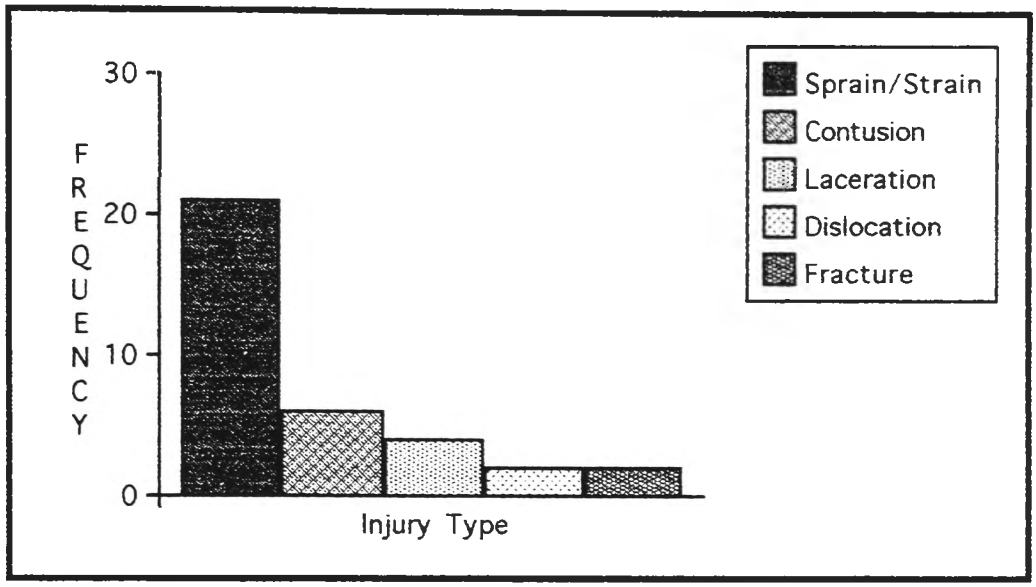


* Injuries sustained while manual handling at another SSP

As can be seen from Table 4.1.2.2. the incidence of repeated manual handling injuries increased markedly as staff ages increased. This may be attributed to the majority of respondents indicating they were over 45 years of age, or cumulative strain from repeated manual handling over many years. This was not investigated during this research, however further investigation to determine if there is a causal relationship would be advantageous (particularly to the school), in light of the research finding by Brinkman (et al 1994) that there is currently insufficient research on the effects of cumulative trauma, although 'BackPak' (WorkCover 1995) assumes cumulative strain to be a significant factor in manual handling injury occurrence.

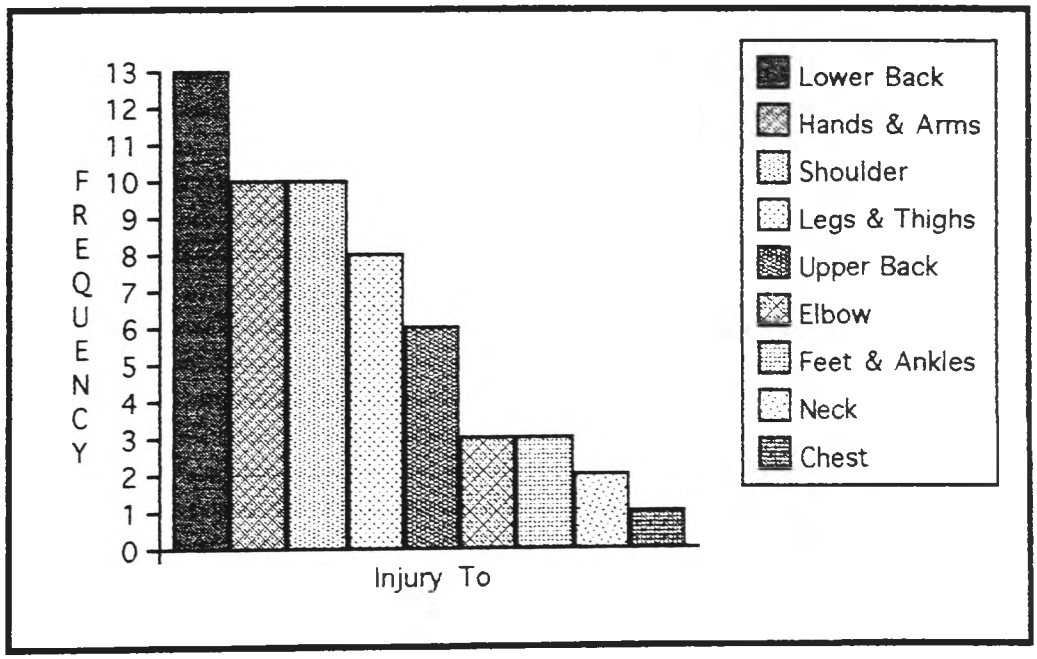
Except for the cleaner and general assistant the remainder of the injured respondents were females. No male teacher who responded to the survey reported sustaining an injury due to manual handling.

Figure 4.1.2.3 Nature of Injury



Sixty percent of all injuries sustained by respondents were strains and sprains. Almost all were the result of manually handling the school's students, as can be seen from the activities cited in Figure 4.1.2.1.

Figure 4.1.2.4 Bodily Locations of Injury



It can be seen from Figure 4.1.2.4. that 13 respondents (50% of those who had previously been injured) have previously injured their lower back. A further 5 respondents reported that they had sustained upper back injuries. Therefore a total of 18 respondents (47.4%) have sustained back injuries. All of these injuries were reported as due to manual handling.

Of the 26 respondents who have sustained workplace injuries, 19 reported that they had been injured on more than one occasion. Almost all (88.5%) staff members who had sustained an injury continued to work after they were injured. The main reason cited for this was that the injury simply was not severe enough to warrant time off work (82.6%), closely followed by the belief that the injury would fix itself (47.8%). While continuing to work because an injury is not severe enough to warrant a work stoppage is a valid and acceptable reason, it is often difficult for non medically trained personnel to accurately make that determination. A small percentage (13%) claimed that they were too busy to stop working. Further one-off comments stated that they (staff) were casually employed, or, they simply had to finish the day. These comments are cause for concern, particularly if the injury required some attention or if it contributed to a more severe injury later. Continuing to work after sustaining an injury because staff considered themselves too busy to stop, or because they were casual at the time of their injury, suggests a possible avenue of investigation for the school's O.H.&S. committee in the future. One respondent reported their belief that 'they had to continue working to finish the day' after sustaining an injury. This is possibly part of a cultural belief within the school and this also warrants further investigation by the school's O.H.&S. committee.

Table 4.1.2.3 Initial Response by Worker to Injury

	Injured more than Once (19)	Injured only once (7)
Claimed W.C.	16	3
Not claimed W.C.	3	4
Used Sick Leave	13	3
Continued to work though injured	18	5
Experienced pain at work without injury	16	6

Table 4.1.2.3 shows that a significant proportion (61%) of staff who sustained injuries have used sick leave instead of claiming W.C. This is in line with Worksafe Australia's (1994c) survey that many workplace injuries are not reported. It is also interesting to note that most of the respondents who have sustained a workplace injury have also experienced pain while they are not injured. Musculoskeletal pain may be an indicator that the muscle strength is inadequate for the tasks required of staff. This aspect would need to be tracked over a period of time to see if in fact staff members are experiencing musculoskeletal pain prior to becoming injured, or if they are returning to work without adequate time for sufficient healing.

This table (4.1.2.3.) also highlights the proportion of respondents (69%) who continued to work though they had sustained an injury. Further research could investigate whether these staff members are the ones who are experiencing pain while working.

Table 4.1.2.4 Consequence of Being Injured

Injured	More than Once (19)	Once (7)
Time off work	17	4
Physiotherapy	14	5
Change of lifestyle	10	0
Change of work practice	2	0
Surgery	1	1
Hydro & exercise therapy	1	0

Most (81%) of the respondents who have previously been injured have had time off work (Table 4.1.2.4.). Given the nature of most of these injuries (refer to Figure 4.1.2.3) it is appropriate that most (73%) of the respondents stated they had physiotherapy as a treatment. As a direct consequence of sustaining their injuries ten respondents (38%) believe they have altered their lifestyle, yet only two have altered their work practices. This could be due to one of two factors. Either they believe they are unable to change their work practice, or they are unaware that their work practice may be a contributing factor. Using the information from Question 25 (Appendix Q) it is possibly the former. This finding could be further investigated by the school, particularly if the injury was sustained as a result of work practice requirements.

4.1.3. Current Individual Injury Prevention Practices

Staff were asked to indicate whether they were currently participating in any activities that would reduce the likelihood of their sustaining an injury.

Table 4.1.3.1. Proactive Measures Currently Used

Preventative Measures	Injured [24] Yes [2] No	Not Injured [8] Yes [4] No
Exercise fitness activities	19	4
Careful / correct lifting	13	3
Two person lift	6	1
Yoga	5	
Lifting workshops	4	
Secure equipment		4
Warm up exercises	3	
Minimising lifting	2	
Other (see App R)	10	4

Thirty two (84%) of the respondents stated that they used some form of proactive measure to reduce/eliminate the likelihood of sustaining injuries at their workplace. A variety of strategies were used by respondents (see Table 4.1.3.1.). Exercise and fitness activities were the most frequent response (60.5%) closely followed by careful lifting (42%). By comparing these activities to the DSE's risk control hierarchy (Appendix B) the most effective activity is that of minimising lifting (elimination or substitution), while workshops are the least effective method.

4.1.4. Unsafe / Physically difficult Areas

Two main activities were cited as being the most physically difficult and/or unsafe. Each accounted for 31.6% of the response (Appendix Q Question 25) and concerned manual handling. One is the positioning of students, while the other is lifting students particularly the heavy ones, but not discounting the lighter ones. There were many one-off comments that illustrate the range of difficulties perceived by the staff. Three respondents did not state any unsafe/ physically demanding aspects. The concerns listed by staff were placed onto a cause and effect diagram (Appendix T) as well as a relations diagram

(Appendix U) . This was presented to and discussed with the school's O.H.&S. committee. The issues are complex and not easily addressed. It is important for staff to note that the list is not exhaustive.

4.1.5. Knowledge and Usage of Workers' Compensation

A total of 13 respondents (34.2%) believe they know how Workers Compensation works in the state of New South Wales. Of these thirteen respondents, eleven have previously sustained injuries at their workplace (Appendix R). This means that fifteen respondents have previously been injured, but do not know how W.C. works.

Given the information in Table 4.1.2.3, where more than half of the previously injured respondents (61%) reported that they had used sick leave (instead of W.C. leave), this finding is compatible with previous research (Wooden 1992). Therefore staff may be paying medical bills for work related injuries or using their sick leave inappropriately. They may also be unaware that should they become injured and unable to work for longer than 26 weeks, their weekly payments will be reduced. Table 4.1.5.1. shows that the members of the school's senior management (category Executive Non-Teaching) believe they know exactly how W.C. works and therefore should be able to impart this knowledge to all employees on a needs basis.

Table 4.1.5.1 Knowledge of W. C.

Classification	NOT FULL KNOWLEDGE	FULL KNOWLEDGE
Classroom teacher/ teacher librarian	Δ ■ ■ ■ ■ ••••••	■ ■ •••
Cleaner	○ ■	
Clerical/office	•	
Executive (Teaching)	Δ •	
Executive (Non-Teaching)		○ •
General Assistant	○	
Teacher's Aide	■ ••••••	••••
Other - Support Services	■	

KEY		
	■ Female Not Injured	• Female Injured
	Δ Male Not Injured	○ Male Injured

4.1.6. Summary of Questionnaire One

Research highlights the female gender and increasing age as a contributing factor to sustaining workplace musculoskeletal injuries. Based upon the information from respondents it appears that the staff at Wattle St SSP are predominantly female, over 43 years of age, with more than half of them previously sustaining a musculoskeletal injury as a result of manual handling students at the school. Many staff have used sick leave instead of claiming W.C. which supports a finding from one Worksafe survey that as many as half of all W.C. injuries are not reported.

The most significant factor though, appears to be the length of service at the school. Most staff who have been at the school for longer than six years have sustained a workplace injury.

Many staff (84%) are already participating in intervention practices which they believe will reduce their chances of sustaining an injury. Over 60% of staff believe their fitness activities will assist them in this endeavour. Just under 8% of staff use warm up activities as a preventative measure. The above data aligns itself with research findings but also highlights the challenge that the staff at Wattle St SSP have in identifying reasons for their current injury incidence rate. If length of service is a significant variable in staff sustaining injuries, then work practices and work stations must be analysed to determine their impact upon these injuries.

4.2 Checksheet

While much was written about musculoskeletal injuries, there was no research found about 'warnings' or 'near misses' in relation to sustaining these injuries. Though unsupported (or rejected) by research it was premised that pain and/or stiffness may be an indicator of muscle weakness for the tasks that were required by staff. It was also considered to be an effective awareness raising exercise. Using this premise a checksheet (Appendix G) was developed. The findings from Questionnaire One (Table 4.1.2.3), demonstrate that there are some staff experiencing pain. Response rate for this sheet was disappointing with a total of eleven respondents. This constitutes 18% of the school staff. Possible reasons for this are that staff did not perceive the checksheet as valuable, it was poorly designed, it was too time-consuming, or staff were simply too busy to return it to the office by the required day. This is in line with the research limitation of not being on-site throughout.

Eight respondents had been previously injured, and one respondent was male.

Table 4.2.1.1. Staff Experiencing Pain

Classification	Number of staff	NONE	RARELY	WEEKLY	MOST DAYS	DAILY
Classroom teacher/ teacher librarian	5	1	1		2	1
Executive (Teaching)	2			1		1
Executive (Non-Teaching)	1	1				
Teacher's Aide (Special)	3				3	
Total	**11**	**2**	**1**	**1**	**5**	**2**

Table 4.2.1.1 shows that of the eleven respondents, only two did not experience any pain throughout the 4 week period.

Table 4.2.1.2. Weekly Average of When and Where Staff Experience Pain

Pain	Mon	Tues	Wed	Thurs	Fri
Neck	2.25	2	1.75	1.75	2
Rad to shoulder	0	0	0	0.25	0.25
Elbow L	0	0.25			
Elbow R					0.25
Wrist R		0.5	0.25	0.25	0
Back L	3.5	3.25	3.25	3	2
Back U	0.25	0.25	0.5	0.25	

On the checksheet each staff member could indicate the number of days they experienced pain while manual handling. By averaging this data we could say that back pain is far more prevalent than any other pain and that by using Table 4.2.1.2 we see that on average 3.5 staff members are experiencing back pain on Mondays, Tuesdays and Wednesdays, with an average of 2.25 staff members experiencing neck pain on Mondays.

An analysis of when staff were experiencing pain shows that the occurrence of pain is persistent. It is important to realise that some staff are experiencing pain on a daily or almost daily basis.

Table 4.2.1.3. Areas of Stiffness Experienced

Areas	Mon	Tues	Wed	Thurs	Fri
Neck	2	5	4	4	5
Shoulder L		1	1		
Back	6	7	2	2	6

While there are staff members who experience stiffness as well as pain, its occurrence is far less (Table 4.2.1.3.). It is possible to note that the areas of neck and back are the two most prominent areas in both of the above tables. Injury records from the school for the period of February - July 1995 (Table 4.5.2.1.) show the back and neck as only the fourth and fifth (respectively) most frequently recorded body locations when injured, behind shoulder,leg and arm injuries.

Therefore while respondents reported experiencing pain and stiffness predominantly in the lower back and the neck, the analysis of staff injury records (Table 4.5.2.1.) showed the shoulder, leg and arm, as the three most common body locations injured. This discrepancy may be due to a number of factors. The injury records do not currently separate major injuries from minor injuries. The staff injuries scrutinised are for a relatively short time interval, and therefore may not be a true reflection of injury locations. Or finally, pain and stiffness may not be reliable in predicting injury. In order to discount the possibility of pain and stiffness as an indicator, the school's O.H.&S. committee needs to analyse staff injury records into the above categories to see if any association emerges.

4.3 Stretching Exercises (Appendix H)

Copies of the stretching program were made available to all staff members who were participating in this research. The exercises were compiled from the Worksafe (1989: b), Resource Kit. This kit includes back strengthening exercises - a copy of which was made available to the school for their perusal and information as well as lifestyle information on back care. This kit was discussed with the school's O.H.&S. committee at a formal meeting. Most of the exercises were demonstrated to staff at the initial staff meeting on Monday April 24th 1995. Staff were asked to trial these stretching exercises for a period of ten weeks, five were at the end of term 2 (May - June) and the following five weeks were at the beginning of term 3 (July - August), as this was a mutually convenient time slot, and allowed the staff to focus on one component of the research at a time. The second questionnaire asked respondents to indicate levels of implementation and perceived effectiveness.

4.4 Questionnaire Two

The final questionnaire (Appendix I) contained three domains. The first domain was a risk assessment (the first 18 questions) taken directly from Worksafe Australia's (1992 a) Manual Handling Risk Identification Checklist, and was itself broken into the following four sections (by Worksafe).

A. Information relating to the movements and posture of staff required to manually handle (Questions 1-5).
B. The task and the nature of the object being manually handled (Questions 6-11).
C. The work environment (Questions 12-15).
D. Individual factors such as clothing, age, disabilities, or returning to work after an extended period (Questions 16-18).

The questionnaire also looked at staff identifying their participation in the school's fitness programs and their perceived value of these programs (Questions 19-21). The final section of the questionnaire looked at identifying the amount of manual handling that staff were required to do as part of their job.

After a two week period (between 23/8/95 and 6/9/1995), 3 questionnaires had been completed (5% of total staff). A further two week period (until the end of term 3 September 22nd 1995), was allowed for staff to finish the questionnaire as they were time consuming to complete. After this four week period there were a total of eleven questionnaires returned. This is the same response rate as for the checksheet (18% of the total staff). Of the eleven, four did not remember their allotted numeral, therefore it was not possible to track their responses, throughout all of the data.

This response rate was particularly disappointing. Possible reasons for the poor response include the difficult task of listing the amount of manual handling that was occurring at the school. It is also possible that staff interest had waned due to the long period of time since the beginning of the research. Perhaps there was insufficient information given to the school about the importance of risk assessment, or even how to conduct a risk assessment. Or it may indicate a lack of priority and interest in the area of O.H.&S. and staff injuries, which is in line with the Industry Commission's finding from its inquiry into O.H.&S. in Australia (Industry Commission 1995). Combined with the indicated lack of knowledge about W.C. (Table 4.1.5.1), staff may not perceive any intervention as resulting in change, or they may consider themselves to be disempowered to induce change.

Had the researcher been on-site it is possible that the return rate may have been higher.

4.4.1. Risk Assessment

Do the perceptions of eleven people suffice as an on-site risk assessment? Has the school fully implemented its mandatory requirement in relation to The National Standard for Manual Handling Section 4.1 (Worksafe 1990 a :8), to undertake a risk assessment ? The National Standard for manual Handling states that "an employer shall ensure that manual handling...is examined and assessed" (Worksafe 1990 a :8). It does not stipulate who should do it.

Worksafe Australia (1990 a) states that every yes response to their manual handling risk assessment question warrants further assessment in that area. Of the eighteen questions in this questionnaire (Appendix I), all but one question elicited at least one 'yes' reply (Figure 4.4.1.1.) from respondents. Furthermore, Worksafe Australia states that the more yes responses to a particular question, then the higher the priority should be in that area. The data from questionnaire one indicates that at least 43% of staff have experienced work-related musculoskeletal strains and sprains and at least 40% of the total staff have experienced their injuries due to manual handling.

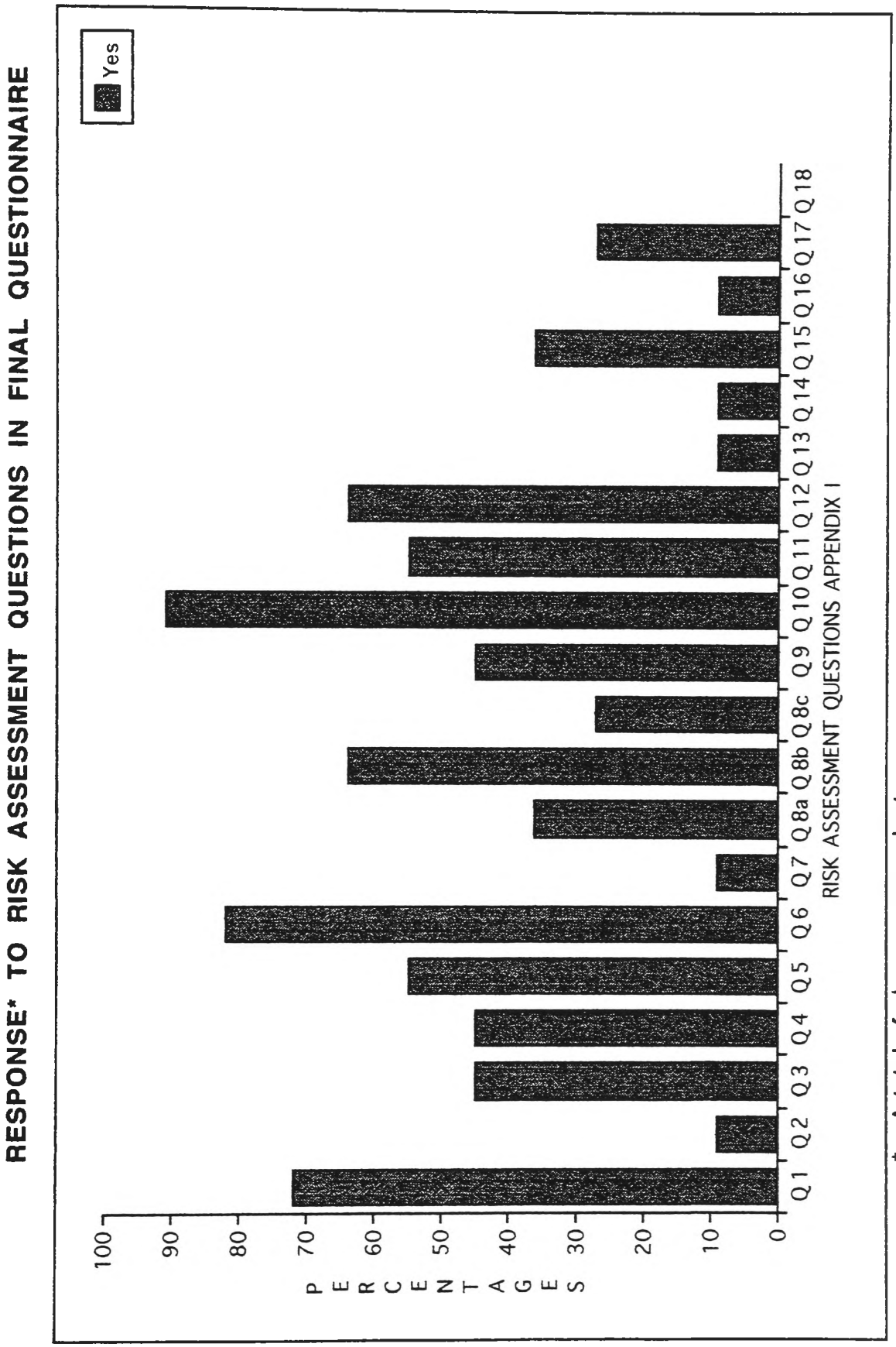
Figure 4.4.1.1. shows that more than fifty percent of respondents have identified as a risk : the amount and type of bending they are required to do; awkward positions they are required to be in; the amount of time spent manually handling; the weight of students and staff positions during manual handling; the nature of the load, and the ability to adequately grip the load; as well as the available space within which to manually handle.

While no question received a unanimous yes from all respondents, Figure 4.4.1.1. shows that question 10 (whether the load is difficult or awkward to handle), was the closest receiving a total of ten 'yes' responses. This is not surprising, given that the staff are manually handling students who are at times awkward and unpredictable in their movements. The physical nature of students is something that the school has no direct control over. The school was specifically built to educate students assessed as moderately or severely intellectually disabled. This is determined by DSE policy. Physical disability is not part of the assessment criteria for placement.

Responses to question 6 (whether manual handling is performed frequently or for long time periods of time) received nine 'yes' responses. When this response is compared to the amount of lifting being performed by some staff members (see Table 4.4.4.2), it is possible to comprehend why almost 82% of respondents answered yes to this question.

Therefore, in order to satisfy the Workcover Authority's requirement to further investigate areas identified as risks, the school may implement the DSE Risk Control Hierarchy of Control Systems (Appendix B) to determine how it is possible to reduce staff injuries, with regard to each area identified by staff in Figure 4.4.1.1. Not all will be within the school's control to effect change (such as the physical disabilities of some students), nor will the school have sufficient resources available to implement the necessary changes. Thus the school needs to identify systemic issues and inform the DSE of its findings (using Appendix O). This will assist the DSE to understand the school's needs in complying with the legal requirements of manual handling.

Figure 4.4.1.1. Yes Responses to Risk Assessment Questions



4.4.2 School Exercise Program

When employees are required to manually handle it is important for the muscles to be sufficiently strong enough to cope with the job at hand (Barry et al 1993; Feldstein et al 1993; Gunsch 1993; Kerr & Vos 1993; Shi 1993; Trafimow et al 1993; Genaidy et al 1992; Kroemer 1992; Matthes 1992 b). Wattle St SSP recognised this need and as a result initiated its own exercise program, concentrated in one section of the school where the majority of manual handling occurs, at the beginning of term 2 (April 1995). These exercises were on offer every day at 8.45am (which is when staff are required to be at school), and were run by the executive teacher in charge of this section of the school. Not all staff were able to attend these classes daily as they had meetings to attend (no more than 1 per week), or morning supervision duties to perform (no more than 2 per week). Most staff however, had a minimum of two mornings each week where they would have been able to attend these classes - had they wished to.

Table 4.4.2.1. Assessment of The School's Exercise Program

	Participation in exercise classes*	Effectiveness of exercises**	
Always	0		
3 or more/wk	1	Did help	4
1-3 x /wk	4	Probably helped	2
Rarely	0	Too busy	3
Never	4	Waste of time	0
What class?	3		

* One respondent marked '1-3 times/week' as well as 'what class'.
** No response from 2 respondents

It is not possible to determine if the staff who responded to the survey were amongst those who work in the section of the school where the classes were on offer. The classes however, discontinued after a term. The reason for this is unknown but needs to be investigated by the school. Possible reasons

include the classes being offered at an inconvenient time, the exercises themselves were either too strenuous, or not strenuous enough, or there may have been a perception that these classes were unimportant. Table 4.4.2.1 shows that some staff members reported that they were unaware of its existence, while others considered themselves too busy to attend. One respondent indicated their eagerness for the re-introduction of the classes.

The research's desired outcome (see 3.1.3) of staff taking responsibility for their own health and safety by exercising to improve their muscular fitness does not appear to have occurred, certainly not through participation in the school provided exercise program. The O.H.&S. committee at the school should investigate whether there were problems at the school level, or whether staff are exercising in the privacy of their own homes, or at local gymnasiums.

4.4.3. Stretching program (Appendix H)

There is research to suggest that it is vital to prepare muscles prior to lifting by performing some simple stretches (Dolan 1993; Feldstein et al 1993; Gunsch 1993; Genaidy et al 1992; Guo et al 1992; Kroemer 1992; Matthes 1992b; Worksafe 1992 b; Kurz 1991). The stretching program was initially mentioned to staff by the researcher at their formal staff meeting in April. The program was taken from Worksafe's "Preventing Back Pain at Work' Resource Kit (Worksafe 1989b). There are stretches to prepare the neck, shoulders, arms, trunk,lower limbs, hips, lumbar region as well as some deep breathing exercises. Staff were shown some of the simple exercises by the researcher (in April 1995) together with how it was possible to incorporate them into work routines. They were also informed of the rationale behind the program and its inherent value. Most of the stretches did not require staff to stop working, they could be done in transit, either on the way to manually handle, or returning to

the classroom from a break. The back stretches however, did require sitting on the floor for some seconds and may be considered awkward and time-consuming.

There was a delay in implementing these exercises, as staff were asked by the researcher to firstly complete a background questionnaire, and monitor any pain they may be experiencing at their workplace when manually handling. Therefore, there was a five week lapse between the staff meeting and introduction of the stretching program. Staff were free to implement stretches from April, but they were not given the Worksafe (1989 b) exercises (Appendix H) until May (1995). The rationale for this was for staff to focus on one component of the program at a time, rather than becoming overburdened with multiple tasks, given that they were already very busy people.

Table 4.4.3.1. Assessment of Stretching Program Effectiveness

	Prepared muscles by stretching	Effectiveness of stretching**	
Always	0		
Mostly	4	Did help	4
Once/day	2	Probably helped	4
Rarely	4	Too busy	2
Never	1	Waste of time	0
Why stretch?	0		

** No response from 1 respondent

As can be seen from the responses while most respondents do believe in the intrinsic value of stretching prior to lifting, it is still not being implemented by the majority of respondents. As there was no monitoring of whether staff stretched prior to this program's introduction, it is not possible to state whether any change in behaviour has occurred since the introduction of the stretching program, although 3 respondents from the initial questionnaire indicated

warm-up activities as a preventative strategy (see Table 4.1.3.1.).

While it can be argued that staff may be exercising at home, preparing muscles can only be achieved immediately prior to manual handling, and therefore must be completed at the school. It is important to note that 36% of the staff who responded indicated that they did stretch most of the time. Through comparing this incidence to the results of when staff injuries were occurring (see Table 4.5.5.1.), it is possible to note that in the six month period of the staff injury records scrutinised, almost half (46%) of the injuries occurred in the morning. The school's O.H.&S. committee could investigate whether these are body stressing injuries, and if so, whether they are due to a specific morning activity, or an indication that muscles are inadequately being prepared by staff for manual handling.

4.4.4. Manual Handling

It was considered important to determine what the current levels of manual handling are at the school. Therefore, the final questionnaire sought to establish some staff continuum by asking all staff to monitor the amount and type of manual handling they perform across two whole days. One day was to be the one staff considered to be their lightest, while the other was to be their heaviest. This way it would be possible to glean some indication as to the frequency of manual handling.

A manual handling tally sheet (Appendix I page 4) was developed using the Worksafe's definition of manual handling as ..."lifting, lowering, pushing, pulling, carrying, moving, holding or restraining any object, animal or person" (1992 a:1). It was believed that the nature of the load was a significant factor. Therefore staff were asked to indicate whether a load was heavy, light, and/or awkward.The results indicate a wide variance across staff (table 4.4.4.1). Staff

were given guidelines as to what constituted heavy, light and awkward on the third page of the second questionnaire (Appendix I).

The action of lifting and lowering was considered as one. So was pushing and pulling, carrying and moving, and finally holding and restraining. Therefore, staff had four different actions that could be involved to complete an activity where a student was being manually handled. Toileting a student involves more than one action (See appendix IA) and could easily result in 15 manual actions. As there are usually 6 students in classes that require this level of care, it is possible to estimate that if all students are toileted and positioned at least three times a day, there could easily be 270 actions (based on appendix IA's task analysis) by one staff member, every day. This is not counting playground duty, bus loading/ unloading each morning and afternoon, or any other miscellaneous manual handling tasks that occur incidentally.

Table 4.4.4.1. Individual Tallies on Amount of Manual Handling

Respondent	1	2	3	4	5	6	7	8	9	10	11
Heaviest day	300	36	39	6	35	20	41	81	88	99	34
Lightest day	163	24	28	6	12	9	33	53	9	70	2
Average	231.5	30	33.5	6	23.5	14.5	37	67	48.9	84.5	18
Category	G	G	U	A	A	D	U	G	A	A	A

KEY			
	U	Unknown	A Classroom teacher/ teacher librarian
	G	Teacher's Aide	D Executive (Teaching)

One respondent did in fact tally their daily (heaviest) manual handling actions at 300. It should be assumed that this staff member works in a class with six severely intellectually and physically disabled students. Another respondent

who reported six daily manual handling actions can be assumed as working in a class where students are more independent and do not require physical care. Given that there are at least eight classes (with 16 staff members) that could require this high level of physical care, it is possible to postulate that many staff did not return their questionnaires because they were simply too busy to count actions to fill in a tally sheet. The working day is approximately 6 hours long (time is deducted for breaks). Therefore to complete 300 manual handling operations in 6 hours, it is at a rate of 50 per hour, or close to one action per minute.

While not all respondents could remember their allotted numeral, some did and it was possible to categorise these staff into their school roles. It could not however, indicate which section of the school these staff worked, or the nature of their students.

The amount of manual handling was totalled across the respondents and left in the various categories of manual handling, so that ranges could be determined.

Table 4.4.4.2. Reported Staff Range of Manual Handling Actions

	RANGE	Between Heavy & Light Days	
TOTALS	Heavy	Light	Awkward
Lifting/ Lowering	75 → 183	32 → 49	55 → 97
Pushing/Pulling	33 → 68	24 → 34	22 → 63
Carrying/Moving	28 → 63	40 → 64	15 → 31
Holding/ Restraining	20 → 32	16 → 32	40 → 65

The range is shown in Table 4.4.4.2. There is a wide variation across the various manual handling actions that staff are required to perform daily. There is a lot more lifting and lowering than any other action, and many actions are

awkward and/or heavy, as opposed to light and easy. However it must be remembered that these are the totals for all eleven respondents, not their averages (Table 4.4.4.3)

Table 4.4.4.3 Average Range of Staff Manual Handling Actions

	RANGE Between Heavy & Light Days		
AVERAGES*	Heavy	Light	Awkward
Lifting/ Lowering	7 → 17	3 → 4	5 → 9
Pushing/Pulling	3 → 6	2 → 3	2 → 6
Carrying/Moving	3 → 6	4 → 6	1 → 3
Holding/ Restraining	2 → 3	1 → 3	4 → 6
Total	15 → 32	10 → 16	12 → 24
TOTAL DAILY AVERAGE		37 → 72	

* Rounded to the nearest whole number

Table 4.4.4.3. shows that on average, staff are manually handling every 5 - 10 minutes of every day, all day long, and that 2-4 times every hour the load being handled is awkward. Data shows that respondents are more likely to handle a heavy load than a light one, and more loads are awkward than light. It could be argued that the awkward category of manual handling should not be included in the total average, as it may be included within the heavy and light category with staff indicating how many manual handling actions were awkward. Raw data (Appendix V) indicates that this is not the case for at least five respondents (respondents number 5,6,7,8,&10), as they have more awkward 'actions' than combined light and heavy 'actions' in some columns.

4.4.5. Summary of Questionnaire Two

The result of the manual handling risk assessment provides tangible direction for the school's O.H.&S. committee. Their challenge now is to conduct further investigations and then develop an action plan based on all of the results.

The school's current emphasis on providing fitness activities for staff was not known by all staff members, and could be a contributing reason why they were discontinued after a ten week period. The classes may have ceased because the teacher in charge of the program left on long service leave and no-one replaced her. It is important for the school to investigate the reasons behind the cessation of the classes.

The stretching exercises were not widely implemented, although just over 50% of the respondents stated that they were stretching at least once a day. It must be remembered however, that only 18% of staff responded, therefore up to 91% of staff may not be preparing their muscles at all.

The initial aim of staff reducing their musculoskeletal injuries (incidence and severity) through their participation in an intervention program has not been achieved. This is primarily due to staff non-participation in the intervention. Reasons for this could be attributed to poor design, the researcher being off site, or be embedded in the beliefs and attitudes of the staff themselves.

Whether the responses of 18% of staff indicate the true range continuum of manual handling at the school is doubtful. What it can indicate though is an apparent disparity in this one job area. As such, the school could investigate ways of reducing this inconsistency through such aspects as yearly job rotation, as well as the amount of manual handling that occurs outside the classroom (such as various playground duties).

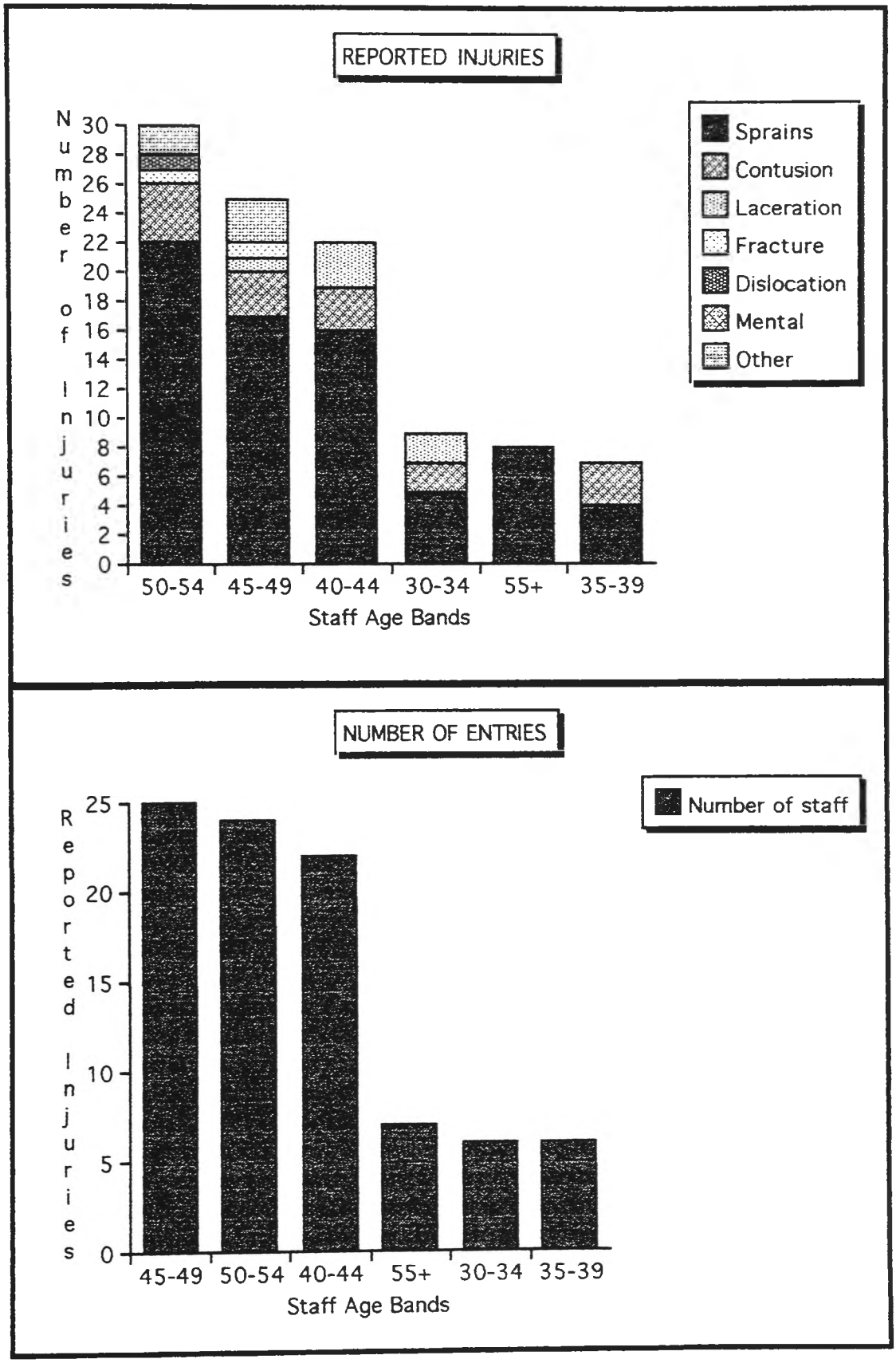
4.5 School Records

4.5.1. Wattle St SSP Injury Records

Some of the staff at the school are sustaining body stressing injuries the

Wattle St SSP Injury Records February - July 1995

Figure 4.5.1.1



degree of which they are concerned about. In the 6 month period from February to July 1995, there were 84 'actions' that resulted in some form of injury being formally recorded by staff.

The chairperson of the O.H.&S. committee analysed the school's injury records (which are housed in a loose leaf folder) for a six month period (February - July 1995) and released this information (Appendix X) after securing permission from the school's senior management. Not all of the information contained within it tallies correctly as there are some multiple injuries recorded. It is not possible to analyse trends, as there is no indication as to when the injuries occurred, other than the part of the day they occurred. They have been grouped using the age bands within questionnaire one, and the injury categories used by the NSW Department of School Education.

A staff of sixty adults recording a total of 84 injury entries within a 6 month period suggests that there are either a small number of people being injured frequently, or a larger population being injured periodically. This is something the school should analyse in far greater detail to ascertain exactly what is happening to whom, when, how and why.

It is apparent from Figure 4.5.1.1. that the school's injury records (albeit only six months) support the injuries reported by the thirty eight respondents to questionnaire one. Sprains/strains are the most prevalent injury category currently sustained by the school staff. The incidence of injury appears to increase with age, however, the school's principal confirmed that the school staff population is itself generally between forty and fifty-five years of age, and therefore using an average may dispute that point.

In order to compare the school's injury incidence rate in relation to other

organisations in NSW, Workcover's incidence rate of injury formula was used. This formula looks at major injuries where employees are absent from their workplace for five or more consecutive days due to a workplace sustained injury. Input from the school's O.H.&S. committee states that for the 1994/1995 fiscal period three staff members at the school sustained a major (musculoskeletal) injury (as a result of manual handling) that required them to be absent from work for more than 5 consecutive working days. Therefore using Workcover's formula of

$$\frac{\text{Number of injuries}}{\text{Number of staff}} \times 1000$$

$$\frac{\text{Number of injuries} = 3}{\text{Number of staff} = 60} \times 1000 = 50$$

Thus Wattle St SSP has a current major injury incidence rate of 50 per 1000 employees.

While the 1994/95 statistical information is not yet available from the Workcover Authority, using Table 4.5.1.1. it is reasonable to predict that the school's incidence rate is significantly higher than the NSW state average. Further information from the school's O.H.&S. committee reveals that all three (100%) major injuries at the school for the 1994/1995 period were body stressing injuries, with the back injury percentage at 66.67%. Given the information in Table 4.5.1.1. these figures are higher than what would be expected in the Workcover Authority's 1994/1995 averages.

Table 4.5.1.1. Workplace Injuries NSW

Source Workcover NSW

Incidence	90/91	91/92	92/93	93/94
Workers injured	20/1000	19/1000	18/1000	19/1000
Body stressing	nearly 1/3	over 1/3	36%	37%
Back Injury	over 25%	30%	30%	31%

Using Workcover's statistics for the previous four financial years (Table 4.5.1.1.) it can be seen that 1 major injury at the school results in a better than state average (at 16.67/1000). Unfortunately 2 major injuries puts the school at an injury incidence rate of 33.3 (per 1000) which is higher than the health industry and comparable to the construction industry (Workcover Authority of New South Wales 1994).

It is important for the school to analyse the extent and severity of their injuries. The sprains/strains may be simple muscle twinges that disappear overnight. The lacerations may be minute scratches that require a band aid, or conversely the sprain/strain may result in a sixth month absence, and the laceration may require twenty sutures. It would be valuable for the school to compare their incidence of body stressing and back injury to those of Workcover (Table 4.5.1.1.).

While the responses from the initial questionnaire showed the lower back to be the most prevalent body location to be injured, the school's injury records highlight the shoulder, arms and legs as sustaining more injuries than the back (Table 4.5.1.2.). It may benefit the school to analyse the body locations (keeping in mind that locations may easily be multiple), together with the nature of injury (see Appendix XA), as an easier and more compact analysis method.

Injury data from Wattle St SSP was not in a form that would allow this information to be extracted in such a manner and the value of doing so may be crucial. It would allow the school to see at a glance the types of injury occurring on which body locations. This would then in turn facilitate their development of a suitable intervention program. It is important to note that the information from the school was not requested in this form as there was an initial belief that ages of staff was a significant factor in staff becoming injured. Data collection however, did not verify this belief. There were however, two significant emergent factors. The first was that of gender. Female staff are indeed more likely to sustain an injury at the school. The second emergent factor was the longer staff spent at the school the more likely they were to sustain an injury.

Table 4.5.1.2. Injured Body Locations from Injury Records

Body Parts	Ages 30-34	35-39	40-44	45-49	50-54	55 +
Head						
Head	0	1	0	2	1	1
Eye	0	0	0	1	1	0
Neck						
Neck	0	1	0	4	3	1
Trunk						
Back	1	1	6	2	2	1
Abdomen	0	1	0	2	2	1
Chest	1	0	1	1	1	0
Upper Limbs						
Shoulder	1	1	2	7	9	1
Arm	2	2	1	3	4	2
Wrist	0	1	3	3	0	0
Hand/ Finger	1	1	1	2	4	0
Lower Limbs						
Leg	2	1	1	6	6	2
Ankle	0	0	1	0	0	0
Foot	1	0	0	1	3	1
TOTAL	9	10	16	34	36	10

Table 4.5.1.2. shows that the injuries to staff are spread across all ages. There

are more staff in the 40 - 55 age bracket at the school and this is reflected by these three groups sustaining the most injuries.

The school collated information regarding the time that injuries were occurring throughout the day. The morning session lasts 115 minutes, the mid session is for 125 minutes, and the afternoon session is 150 minutes long. The morning session is the shortest, yet this is when most of the injuries are occurring (see table 4.5.1.3.). In fact the longer the session, the less injuries are occurring. It would be necessary to investigate what types of injury were occurring in the morning sessions. If they were predominantly of a musculoskeletal nature then it could be investigated as to whether these staff members use any preventative measures such as exercising, and or stretching their muscles prior to lifting. The school could also investigate where these injuries are occurring. Are they centred in one section of the school, a particular activity, or are they all using the same equipment when they are injured? The school's O.H.&S. committee need to talk to the staff being injured to see what their views are regarding why the injury occurred.

Table 4.5.1.3. Wattle St SSP Injury Times

Ages	Time Injuries Occurred		
	Morning	Mid	Afternoon
30- 34	1	3	3
35- 39	3	2	1
40- 44	6	8	8
45- 49	10	4	5
50- 54	15	5	3
55 +	4	2	1
TOTAL	39	24	21

4.5.2. Summary of Recorded Staff Injuries

The school keeps accurate data pertaining to staff injuries. Staff are encouraged to enter any injury irrespective of its degree. Currently these records are housed in a loose leaf folder which could easily be removed, reinserted and become jumbled.

No attempts have been made by the school staff to scrutinise the data themselves. This may be due to privacy concerns expressed by the school's senior management, the DSE's lack of communication re its stance on data synthesis, as well as highlighting the need for more in-depth training and development of staff in this area.

The data analysis for the six month period from February to July 1995 show that there are an average 2.8 entries per annum per staff member with just over 70% of these entries representing musculoskeletal injuries.

Information from the school places their major injury incidence rate for the last financial year at 50/1000 employees with all of these injuries resulting from manual handling, and musculoskeletal in nature.

Injury data from a six month period is too short a time frame upon which to base any definitive conclusions. It is important for the school to regularly analyse this information for comparisons to be made.

Due to the limited amount of injury data provided by Wattle St SSP, it was not possible to place it onto a data base for the school.

4.6 Wattle St SSP O.H.&S. Meetings

At the beginning of this research it was hypothesised that staff who participate in an intervention program aimed at strengthening and warming their muscles prior to lifting would reduce the incidence and severity of their musculoskeletal injuries. It soon became apparent that the issue of musculoskeletal injury was not that simple and that this unitary approach would not achieve the maximum benefit.

The notion of continuous improvement was always a cornerstone to the research, however, it became apparent that continuous improvement of fitness levels while important was not the only aspect the school should be addressing. Literature findings pointed to the inherent benefit of workplace ownership (Dean & Bowen 1994; Spencer 1994; Roughton 1992), teamwork (Trautlein & Milner 1994; Kogi 1993a; Kohn & Friend 1993; Lanier 1992; McAtamney & Corlett 1992), employee participation (Joy 1993; Kogi 1993 b; Mulray 1992), and a proactive approach (Trautlein & Milner 1994 ; Joy 1993; Kogi 1993a&b). Legislation is now more ergonomic in orientation (Lanier 1994) and therefore the emphasis should be fitting the job to the worker (Kohn & Friend 1993; Matthes 1992 a&b; Alexander 1986). All of these principles concur with the Total Quality Management approach.

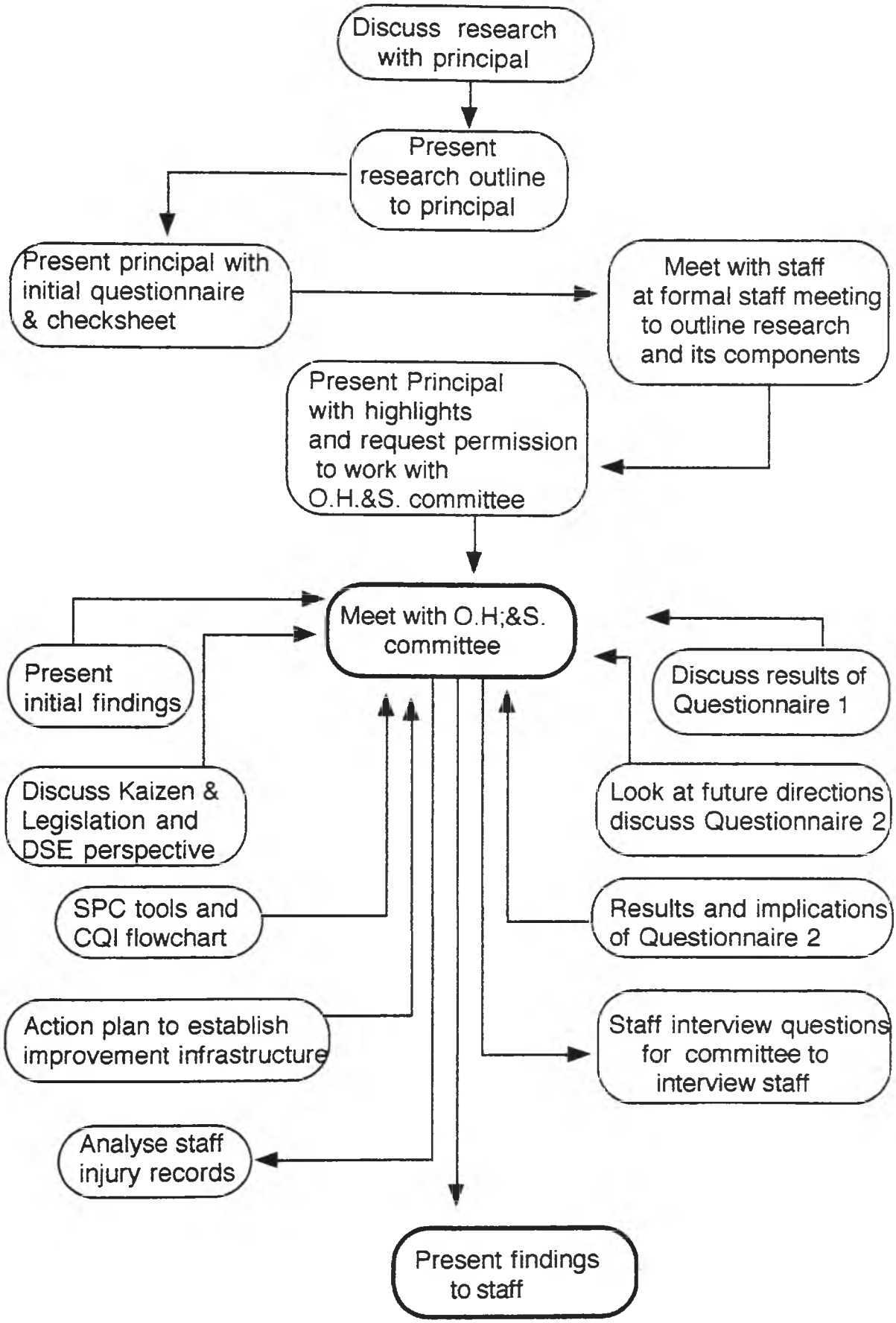
The school currently has a formal O.H.&S. committee with most of the members trained in O.H.&S. The school's management was approached to seek permission for the research to incorporate and utilise the skill and expertise of the O.H.&S. committee, (Appendix W) and the second hypothesis that staff would develop a continuous improvement method such as action research to continue their pursuit of injury reduction was postulated.

Figure 4.6.1.1. shows the interactions between Wattle St SSP staff, particularly the O.H.&S. committee, and the researcher. Not all staff attended the formal staff meeting in April 1995, due to absence or because the school has a policy of separate meetings for teaching staff and the teacher's aides (Special). Teaching staff raised concerns about the time management of completing stretching exercises given the busy work load of those who do the majority of the manual handling at the school.

At the end of November a total of five meetings were held with the O.H.&S. committee on a fortnightly basis starting on August 23rd, with the sixth meeting re-scheduled from November to December 1995. The chairperson was the only member of the committee to attend all five meetings from beginning to end. One committee member was on long service leave for the first 3 meetings, and was not replaced. Other committee members were each absent on one occasion due to prior commitments, and their apologies were extended. No formal minutes of these meetings were recorded, and the school's senior management had to leave early on two occasions as they had other meetings scheduled immediately after. The interactions with the O.H.&S. committee were one sided, with the committee listening to information, strategies and recommendations. While the committee sought clarification on some points, no decisions were made about adopting any plan of action.

The school is a large and busy one. There are many facets to its operation, and it is readily acknowledged that its senior management is exceedingly busy. It is also noted that the meetings held after the O.H.&S. meetings were scheduled by agencies outside the school, and the school's senior management had no control over their timing. However, no effort was made to re-schedule any O.H.&S. meetings to a time when other meetings did not beckon.

Figure 4.6.1.1 Interactions with Wattle St SSP



The school's senior management has stated that this report will be discussed with the school's staff to determine what relevance it may have for the school's future development of O.H.&S. programs.

Therefore given, the poor response rate to the checksheet, and the second questionnaire, the lack of allocated time for the meetings with the O.H.&S. committee, together with the absence of any minutes and development of an action plan, the following conclusion is made. Either the school did not value the research, or there is a low priority attached to O.H.&S. at the school. Given that the chairperson is a casual employee and the only committee member not trained in O.H.&S., there is a strong bias toward the latter.

4.7 DSE Injury Information

Discussions with the South Coast Regional Personnel Manager throughout 1994 and 1995 revealed that the DSE collates O.H.&S. information from data supplied to it by the G.I.O. (as the W.C. Treasury Fund Manager). This information is analysed by the DSE and was distributed quarterly to all Regional Personnel Managers prior to 1995. O.H.&S. data pertaining to the South Coast Region was released to the researcher late in November 1995. It revealed musculoskeletal injuries (sprains and strains) as the most prevalent of injuries (see Figure 1.2.1.), The data provided did not confirm if there was any trend in the incidence of workplace musculoskeletal injuries.

4.8 Barriers to Change

4.8.1. Access to Information

Data relating to O.H.&S. was difficult to obtain from the school. Since the beginning of this research the records for six months (February - July 1995)

have been released (Appendix X). It was not possible to put this information onto a data base due to insufficient information being provided.

Formal requests for statistical information from the DSE were eventually successful in securing information pertaining to the South Coast Region. Since the beginning of 1995 O.H.& S. information has not been released to Regional Offices (Ailwood 1995 b).

One possible reason for this is the current cost of O.H.&S. and the associated low priority afforded this area by the DSE.

The DSE openly acknowledges their O.H.&S. annual property maintenance costs as $18 million between the years 1989 and 1992, (DSE Risk Management Awareness Package 1993), and it is reasonable to suggest that these costs are now higher. It is also reasonable to suggest that the DSE's reluctance to release further data pertaining to the cost of employee injury and disease is primarily because those costs are significantly higher. Therefore allowing for inflation and the trend of escalating O.H.&S. costs over the last few years, the actual direct costs of all O.H.&S. per annum within the DSE may well be in the vicinity of $50 million. Considering that total costs are three to seven times greater than the direct cost (Worksafe 1994c; Qld Nurses Union 1991), this could mean that the bill for O.H.&S. in the NSW Department of School Education is between $150 and $350 million per annum.

The DSE has renamed the Risk Management Policy Unit to Administrative Systems Unit. The inservice for principals on how to implement risk management, was never presented in the South Coast Region. There is little scope, and no focus, on any proactive strategies. Finally, rather than acknowledging that a problem exists, the DSE is currently adopting a fortress

approach (see Table 4.8.2.1.).

O.H.&S. awareness has been greatly highlighted through legislation and publications, since Cumming's (1980) assertion that organisations know the extent of the O.H.&S. risks but do not communicate it to their employees. There has been an increased focus since the introduction of comprehensive generic State and Federal legislations in the mid 1980's to replace (most of) the multitude of industry specific legislations. The Workcover Authority and Worksafe Australia have compiled extensive statistical data bases on all W.C. information supplied to them and more organisations are realising the value of effective safety programs as a way of improving their competitiveness in these increasingly challenging fiscal times. Yet, for all of this, are employees any more knowledgeable about O.H.&S. than they ever were, or is this recent awareness at a management level only?

Lack of access to information was not initially perceived as a barrier. Once it became apparent that it was, it was hypothesised that perhaps the request for this information was in fact unreasonable, and therefore in an endeavour to accurately report on the DSE's and the school's approach, organisations were approached about their current practices regarding the dissemination of their O.H.&S. information. These organisations were randomly selected, from the stratas of service and industry, public sector and private, organisations implementing T.Q.M., and others not implementing T.Q.M. (see 3.3.2.). It was thought that this would provide a continuum within which it would be possible to indicate the DSE's placement.

In September 1995 letters were sent to the Personnel Managers of each organisation. Of the twenty contacted, fifteen (75%) responded (Appendix JA). Of the respondents, eleven organisations (73%) indicated they were

implementing T.Q.M. strategies. Of the fifteen responses, three (20%) reported that they did not disseminate O.H.&S. information beyond their departmental heads.

Of the respondents, twelve (80%) stated that each of their work sites had separate O.H.&S. information collated. Fourteen (93%) of the respondents stated that the O.H.&S. data for the whole organisation was analysed. The last respondent stated that there was no O.H.&S. awareness or desire to develop awareness within management currently. One organisation included a summary of its O.H.&S. current data, including previous years' comparisons, with their response.

Nine respondents (60%) stated that all O.H.&S. information was automatically available to employees of their organisation for research purposes, while a further two (13%) indicated that this would require the CEO's approval. Two organisations did not respond to this question but indicated that they communicate this information to all of their employees regularly, one using the actual figures, while the other provides trends. Six organisations (40%) indicated that their O.H.&S. statistics would be available to people outside their organisation for research purposes, with a further three (21.4%) indicating that this would require the CEO's approval.

One organisation (6.67%) indicated that their O.H.&S. information would not be made available to employees for research purposes, while another two (13.3%) indicated that it would require the CEO's approval.

Of the respondents nine (60%) indicated that they regularly communicate the statistical figures related to O.H.&S. to all of their employees, with a further three (20%) regularly communicating trends and not the actual figures.

Therefore, a total of twelve organisations (80%) share O.H.&S. information with their employees, two organisations (13.3%) do not, while one organisation (6.7 %) cannot as it does not analyse this information.

The DSE's previous approach of communicating O.H.&S. statistical data to departmental heads is comparable with 2 (13.3%) of the organisations that responded. Both are large public service bureaucracies (much like the DSE). Its current approach of not releasing this information beyond Head Office, is in contrast to all of the organisations that analysed its O.H.&S. information and responded.

In terms of releasing this material to employees for research, subject to CEO approval, the DSE is in line with other large public service organisations.

Of the fifteen organisations that responded to the questionnaire, this puts the DSE in a minority position on most points, aligned with one other public service organisation. Its recently implemented lack of dispersement of this information however, is at variance with all other organisations that collate and analyse this data.

According to the NSW Workcover Authorities statistics (1992-1993) the industry of Education, Library and Museum, (within Community Services) sustains the second lowest incidence level for employees injured, and therefore perhaps the DSE does not perceive the need to address O.H.&S. issues as much as other industries that sustain a much higher overall employee incidence level. Close scrutiny reveals however, that while the overall incidence is the second lowest of all industries, Education, Museum and Library services is the third highest industry in median cost incurred (Workcover Table 2.1 1992/93 W.C. statistics).

The reluctance on the part of the school's senior management to release O.H.&S. data is unknown.

4.8.2. Culture

"The ways things are done around here" (Robbins 1993:601), may well encapsulate an organisation's culture. This culture incorporates key characteristics that an organisation values (See Appendix Y). Sonnenfeld analysed culture into four basic groups (Robbins 1993), which he called 'Academy, Club, Baseball, and Fortress' (Table 4.8.2.1.). Each culture group has its own trademarks, and often there are sub-cultures within formal and/or informal groups.

Table 4.8.2.1. Sonnenfeld's Cultures

ACADEMY	**CLUB**
• Steady climbers	• Fit in
• Start as colleges grads	• Loyalty
• Special training	• Seniority
• Careful steering	• Age & Experience
• IBM, Coca Cola GMH	• Government agencies
BASEBALL	**FORTRESS**
• Risk takers	• Survival
• Innovators	• Exper. hard times
• Talented people	• Little job security
• Freedom	• Challenging
• Ad Co, Software Co.,	• Large retailers, Hotels.

Source : Robbins SP (1993) pp604-605

In nursing literature it emerged that its culture was one of putting the patient's needs ahead of staff needs (Feldstein et al 1993). This is also part of the culture at Wattle St SSP. Staff will assist students before thinking about their own needs. Just as a nurse will try to catch a falling patient (Feldstein et al 1993), staff at the school will continue to stop students from hurting themselves when falling down, and risk an injury to themselves in the process.

Workplace culture is crucial, as implementing effective safety programs often requires a change in behaviour (Lanier 1992). The ability of an organisation to adopt a change culture is a key component of O.H.&S. success (Larcombe 1993).

T.Q.M. implementation also requires a change culture (Petersen 1994), and this is another reason why the two (Safety and T.Q.M.) are so compatible.

4.8.3 Responsibility

The issue of responsibility is important. The costs associated with W.C. are not factored into a school's yearly budget allocation (Ailwood 1995 b). School managements do not need to take responsibility for the W.C. levels at their school.There is often an overlap of responsibility across the DSE and schools, particularly in terms of how and when some things will be paid for. When building repairs are necessary (i.e., identified as unsafe), schools are not financially equipped to pay for major repairs and so they submit their claims to Regional Office. This is then prioritised by Regional Office personnel. Each school is required to pay the first $1000 for each claim, after which the respective regional office will pay the remainder - if it considers it important and when it can afford it.

School managements do not currently have the financial and /or human resources necessary to take total responsibility for O.H.&S. at their schools. Yet they are the ones who comprehend the impact of their W.C. levels. The South Coast Regional Office, is not prioritising O.H.&S for staff (Ailwood 1995 b), and this will make it harder for Wattle St SSP to implement its safety program. It is all the more reason why the school must adopt a flowchart such as Appendix O.

4.8.4. Space and Time

Due to space constraints within classroom and toilets, most of the hydraulic lifting tables are positioned against a wall and therefore access to them is restricted. The equipment at the pool and spa work well, albeit slowly. The machine for removing students from vehicles requires staff to bend for minutes at a time, while placing the harness onto the student. This also is a slow process. While taking time is a desirable criterion for student safety, it is possibly a reason why this harness is not often used. Staff may perceive that it is much faster for them to simply remove the student manually in a few seconds, rather than the few minutes the lifting equipment requires.

Throughout the course of this research time has been lost while waiting for the school and the DSE to supply information relating to staff injuries. Lack of access to the data resulted in contacting corporations (see barriers 4.8) to determine if the request for information was unreasonable. This also took time with replies returning across a four week period.

Completing Questionnaire 2 in four weeks instead of the original 2 weeks planned resulted in additional meetings with the O.H.&S. committee of Wattle St SSP well into October, with further meetings planned for November 1995. Due to the researcher working off-site this year, it was necessary to meet with school personnel at fixed times, rather than on a needs basis.

It was not possible to interview staff (Appendix P) due to insufficient time for this to occur. The school's O.H.&S. committee has received a copy of the proposed questions, and have decided to modify this approach with a staff survey to elicit the same information.

4.9 Summary

Questionnaire One's response rate of 63.34% represents a reasonably high proportion of staff. The information from the 38 respondents in questionnaire one suggests quite strongly that the school does in fact have a significant incidence of workplace injury amongst its employees, and that there are many areas that the staff consider to be unsafe and/or physically demanding. It is also apparent that the school has an aging population (average age above 43 years) and that most of the staff are female.

While age is a factor in muscle deterioration (Timiras 1994; Barry et al 1993;Qld Nurses Union 1991), an emerging factor is the length of service that staff (particularly females) have at the school. Of the respondents, all females had sustained a workplace injury by the time they had worked at the school for nine years. It could be argued that most of the staff have in fact only been at the school less than nine years, however table 4.1.1.4. shows that there is only one female who has worked at the school for longer than 6 years and has not yet sustained an injury.

The most prevalent activity undertaken when injury occurs is lifting. Almost all of the activities are the result of manual handling. It is however, one factor that the school cannot eliminate. The school is designed to cater for the needs of students with intellectual and physical disabilities. Non ambulatory students must be regularly lifted and positioned. The school can however implement the DSE's Risk Management Risk Control Flowchart (Appendix B) to address the issue by utilising some other technique. Given that the DSE's Risk Management Package (Appendix A) was never released to Principals of schools in the South Coast Region, it is not surprising that the school did not know of its existence.

Also emerging from questionnaire one is the percentage of staff who have been injured more than once. Table 4.1.2.2. shows that many of the staff who have been injured more than once have been employed at the school as little as 5-9 years. It also shows that no-one who has been injured more than once (at this particular school) has been employed for less than 5 years. In fact, table 4.1.1.4. shows that only two staff who are in the first 4 years at the school have been injured, one injury occurred at another school (of a similar nature), while the other incident was not related to manual handling.

The school injury records highlight the shoulder, arm and leg to be the most frequently reported injury, yet questionnaire one respondents listed the back (particularly the lower back) as the body location most frequently injured. This could be due to the school's injury records only covering a short period, while questionnaire 1 had an open ended time line, it could be seasonal, or perhaps the majority of entries in the staff injury book do not result in serious injuries and therefore staff have forgotten their incidence.

The response rates of the checksheet and the second questionnaire were disappointing, particularly in light of the initial questionnaire response, and the importance of the risk assessment in questionnaire two. This could be due to their being perceived as limited in value, the researcher being off-site for the duration of the research, or the amount of time it took to complete both of them compared to the 15-20 minutes (approximately) that questionnaire 1 required. It could be a combination of all three factors, or any one in isolation.

It is not possible to state whether the school's exercise program or the stretching exercises will result in any change in injury incidence and/or severity, as neither was adequately adopted by staff who responded to questionnaire two.

The school has previously developed fitness programs it believed would reduce the incidence and severity of staff musculoskeletal injuries due to manual handling at the school. There have been classes in back exercises, yoga and lifting at the school. The school's senior management view fitness as important and actively work at keeping themselves fit. While there have been numerous training sessions in lifting over the years, one respondent to Questionnaire One (Appendix Q Q25), did point out that they had not been formally shown how to lift since arriving at the school 5 years ago. This point has credibility for the following reason : it made me realise that in the nine years I had worked at the school in a casual position (initially) and then as a permanent staff member, I did not attend a single formal session on how to lift correctly. This highlights the school's voluntary approach to training and exercise sessions, for both casual and permanent staff.

Over the years as funding and mechanical equipment became available, the school has purchased a variety of mechanical equipment to assist staff with the manual handling of its students. In classes where students are predominantly non-ambulatory those classrooms have hydraulic lifting tables to assist with student toileting and dressing needs. There are also some student toileting areas with these hydraulic tables.The school has separate hydraulic lifts at their swimming pool and spa, as well as a lift machine to remove students from vehicles.

The principles of T.Q.M. were used throughout this research (Appendix Z) in the pursuit of establishing an effective safety infrastructure for the school. The concepts of continuous improvement through Kaizen (Appendix M) were presented to the O.H.&S. committee. Effective safety management was consistently presented as a process, and some statistical process control tools as well as a strategic outline were introduced (see appendices T,U,L & XA).

The aspect of customer focus was also introduced as the basis for improvement, i.e., identifying the needs of the employees, and fitting work stations and work practices around these needs. The importance of employing employee participation and using teams for data compilation as well as problem solving was mooted on several occasions.

Incorporating flexibility into the process and through the purchase of equipment was also part of the research.

Yet for all this, is it possible to expect a non T.Q.M. organisation to implement T.Q.M. principles? Not in the short term. Implementing T.Q.M. requires a long term approach, and the value of this approach will need to be evaluated in 12 months time.

The interactions with the school's O.H.&S. committee while perceived as valuable have not resulted in any tangible changes occurring, other than their analysis of some injury records for the first time. The committee members' levels of awareness however, have been heightened in the areas of legal obligations, risk assessment, injury incidence at the school, the DSE's Risk Management package, current research findings and some strategies and principles that will enable them to implement a process to reduce the current incidence and severity of workplace injuries to staff.

The challenge now is for the school to develop, implement and monitor its own safety process. Given the following factors

- a significant number of staff members have already been injured,
- the current ages, gender and staff length of service at the school;
- the manual handling risks identified by the staff during questionnaire two

- the current lack of priority afforded O.H.&S. within the school as well as by the DSE,

it will be a crucial process to develop and implement as soon as possible.

CHAPTER 5

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

5.0 Introduction

The final deductions of this research are presented together with their ramifications. Recommendations for the school, the Department of School Education, and the NSW Government are presented. In all a total of 36 recommendations are presented. There are recommendations for future research (2), Wattle St SSP (24), The NSW Department of School Education (9), and the NSW Government (1). Each sub-section is presented in order of perceived importance, and within each sub-section the recommendations are prioritised from most to least important. However, to suggest that recommendation 16 takes priority over recommendation 17 is misleading, as the former is at the end of a sub-section, while the latter begins the next sub-section.

This chapter also looks at whether the aims and objectives of this research were achieved, together with identifying the essential challenges for the school as presented in the summary.

5.1 Further Research

Literature findings highlight some controversy over the correct lifting technique. The lifting technique recommended by WorkCover (1991) and the DSE (Ailwood 1995 a), is the squat lift (straight back, knees bent, lowering the body). Yet, there is research to suggest that this may not be the most

sustainable, given the energy it requires of the quadriceps muscles. Kroemer (1992) reported on biomechanical and physiological research that showed the quadriceps muscles are insufficient in strength to continuously execute the squat lift. Therefore, while this lift may be the preferred option in a single 'lift' situation more research is needed in the area of multiple manual handling situations where there is a possibility of muscle fatigue. Staff at Wattle St SSP may in fact be implementing a lifting technique that is not the most appropriate for their situation. It may be necessary for them to initiate exercises that specifically strengthen the quadriceps, or even use a different lifting method altogether.

Brinkman (et al 1994) believes there is insufficient research on the effects of trauma due to cumulative lifting, as well as the effect of one muscle being overloaded. Again this lack of empirical data may be disadvantaging the staff at Wattle St SSP who have based their current practice on recommendations from WorkCover and the DSE, who may be wrong in their assessment.

Recommendation 1

That further research be done in the area of manual handling techniques and resultant muscle effects, particularly in the area of repetitive lifting and its effect on the quadriceps muscles, with a view to establishing ergonomically efficient manual handling techniques.

The results from questionnaire one (Appendix F) and the checksheet (Appendix G) show that there are a few staff members (at least 11%) who are experiencing musculoskeletal pain on a regular basis. It is not known whether this is a warning, or if it is unrelated to sustaining injury. It would benefit the staff at the school if further research was conducted in this area to confirm or reject any association. Should a positive correlation be found then this pain

could be used as a precursor to physical trauma and steps could be taken to preempt the injury.

Recommendation 2

That research be conducted to determine if musculoskeletal pain whilst manual handling is an indicator of sustaining a body stressing injury.

5.2 Wattle St SSP

Some staff at the school are sustaining work-related injuries as a result of manually handling students. Most of these injuries are musculoskeletal in nature, the existence of which was verified via the respondents of the first questionnaire, as well as the limited injury information provided by the school's O.H.&S. committee. The school's senior management also confirmed the preponderance of female staff at the school, and that many staff are over the age of 45 years. Both these factors have implications for the school's management. Research by Nyland and Kelly (1992), states that females have less muscle strength than males, and are therefore more likely to sustain an earlier injury when completing tasks of a similar nature. Also, aging leads to muscle deterioration (Timiras 1994; Barry et al 1993;Qld Nurses Union 1991). The school must somehow circumvent both of these factors.

Reducing staff injuries will be difficult for the school given that

- some staff continue to work after sustaining an injury (13% of previously injured respondents),

- some staff believe themselves too busy to :
  - stop (section 4.1.2.);
  - exercise (Table 4.4.2.1.) ; and/or

- prepare their muscles prior to exercising (Table 4.4.3.1.).

- few respondents (Table 4.4.3.1.) have altered their work practices subsequent to sustaining an injury.

Therefore, some staff members may exacerbate their injuries when they fail to stop upon hurting themselves. Some staff do not sufficiently value the need for them to exercise and/or prepare their muscles. The reasons behind these behaviours (or lack of) must be investigated by the school to determine if they are attributed to attitudes/ workplace culture, work routines, lack of knowledge, lack of training and development, or other miscellaneous reasons.

Finally the school must address the issue of its manual handling risk assessment results.

5.2.1. Knowledge

The school has a formal Occupational Health and Safety committee that meets regularly and complies with the legislative requirements pertaining to committees in workplaces. Three of the four members of this committee were trained in 1994 and the fourth member is currently awaiting a DSE training course.

Despite this training the committee has insufficient knowledge of O.H.&S., specifically in the area of manual handling. They were not aware of the South Coast Region's Manual Handling Memo (Ailwood 1995 a) which was sent to each schools' senior management and outlined the DSE's recommended manual handling approach together with relevant booklets from WorkCover. The school's O.H.&S. committee was unaware that there was a separate National Standard and Code of Practice for Manual Handling. Therefore, they

were uninformed of its mandatory nature (in NSW) and risk assessment orientation. Furthermore, they were also unaware that committee members had a right of access to all O.H.&S. data pertaining to their workplace.

The school's committee, was not informed that the DSE had a Risk Management Policy (Appendix A), as this was not promulgated by the South Coast Regional Office.

Therefore, despite the majority of the committee being trained in O.H.&S. by the DSE, they remain inadequately trained to deal with the O.H.&S. issue most crucial to their school, that is, how to effectively reduce work related manual handling injuries.

In order to rectify this deficit, the school must establish an infrastructure to ensure a comprehensive and continuous source of manual handling information. It is imperative for the school to be knowledgeable about current state legislation and practices, particularly in the area of manual handling.

Recommendation 3

That the school purchases Worksafe Australia's Manual Handling

"National Standard [NOHSC:1001(1990)] and National Code of Practice [NOHSC:2005 (1990)]",

along with relating documentation as a matter of urgency.

Between April and October (1995), the school was exposed to a large amount of data about O.H.&S. injuries and programs. While this information may be considered substantial in nature, it is not exhaustive. Manual handling

research is ongoing and future findings may benefit the school enormously. The next recommendation is therefore made to enable the school to keep abreast of current trends, attitudes, results and priorities in the area of O.H.&S. generally. Worksafe Australia and The WorkCover Authority of NSW both produce free periodicals. The WorkCover Authority of NSW in their pamphlet entitled "How to Get Occupational Health & Safety Information", lists reference books as well as periodicals that it deems as suitable.

Recommendation 4

That the school subscribe to relevant O.H.&S. periodicals.

As the school predominantly has manual handling injuries, it is crucial that they remain abreast of research in this area. Unfortunately there were no publications found that dealt exclusively with manual handling, however an ergonomic based periodical would be the most relevant to the school's manual handling needs.

The WorkCover Authority of NSW recommends the following book:

Tuohy-Main (1994), "A Manual of Handling People" Helios Art, (pub) S.A.

as beneficial in the area of manually handling. The book is currently available only through the Helios Book Store in Adelaide (at a cost of $38.50), although the local branch of the WorkCover Authority of NSW does have a copy which they allow interested parties to peruse, as well as photocopy pertinent pages.

Recommendation 5

That members of the school's O.H.&S. committee examine the book 'Tuohy-Main (1994), "A Manual of Handling People"'. If it is deemed suitable then funds should be made available for its purchase.

Three of the four members of the O.H.&S. committee have undergone the DSE's four day training in basic O.H.&S. Yet, the information they learned is inadequate for their specific needs, and further training may prove beneficial. There are advanced O.H.&S. training sessions available through the DSE as well as the NSW Technical and Further Education (TAFE) system.

Recommendation 6

The school's O.H.&S. committee investigate advanced O.H.&S. training courses to determine if any address the issue of manual handling specifically.

It is crucial that all staff members be provided with information about O.H.&S. with a particular emphasis on manual handling injuries. They need to understand the :

- mechanisms of preventing an injury
  via - risk assessment
    - changes in work practices and work stations
    - fitness and warm-up activities
- contra-indications of continuing to work after sustaining an injury
- process in situ to determine the reason behind each injury
- change/s required to ensure the injury is not duplicated

In order to do this the school's O.H.&S. committee must develop a process to establish what information staff require (including promulgation strategies).

This process must incorporate an infrastructure that ensures periodic updates and ongoing dissemination to all staff. This can only be addressed once the O.H.&S. committee has implemented the initial four recommendations so that they themselves know how to effectively manage the above issues.

Recommendation 7

The school's O.H.&S. committee develop a process (such as P.D.C.A. - see Appendix M) that establishes staff information needs, subsequent communication, monitoring and maintenance strategies (including readjustment of needs) to ensure staff receive (and comprehend) the information necessary for them to effectively participate in the reduction of work-related injuries and/or diseases at their work place.

5.2.2. Networking

The area of manual handling injuries is not relevant to all areas of the DSE. It is predominantly in SSP's that some students are severely physically disabled. The area of manual handling injuries however, is significant in the nursing industry, and it would benefit the school to establish some system whereby information on techniques and equipment could be shared across other establishments. The school should actively seek to utilise the skills and expertise of key personnel in these organisations.

Recommendation 8

That the school establish networks across their region with other establishments that have similar job descriptions (ie nursing homes) as well as organisations that are similarly dealing with the manual handling of these students, so that they may assist each other, and share valuable skills, knowledge and possibly resources in the area of manual handling.

5.2.3. Ergonomic Program

The school's O.H.&S. committee is aware that the most urgent issue they (and indeed the school), must address is the school's major injury incidence rate of 50 (per 1000 people), which is the result of three staff members being injured during the 1994-1995 financial year. All of these major injuries are attributed to manual handling and have resulted in body stressing (musculoskeletal) injuries. Two of these injuries affected the back while the third was a shoulder injury.

The school's management has thus far focused on providing staff with voluntary fitness and back care programs, together with sessions on lifting. Furthermore, when the research was first mooted (to the senior management of the school), it was on the understanding that the exercise and flexibility program was necessary for staff at the school to improve their fitness as well as to prepare their muscles prior to lifting. The school has also regularly purchased mechanical equipment to aid staff, not all of which is used ostensibly due to it being cumbersome and time-consuming. Consequently the school is still focused on fitting the worker to the job, as well as assisting only some staff through its voluntary approach to fitness and lifting sessions. As a result, the O.H.&S. orientation of the school is currently in opposition to current legislation, and there may well be staff members who have been injured as a result of not attending sessions on recommended lifting techniques. Therefore, it is crucial that the school adopt the following recommendation as a matter of urgency.

Recommendation 9

The school refocuses its current O.H.&S. practices, to include ergonomics and job redesign, with their existing fitness programs, to culminate in a comprehensive manual handling approach for the school.

The issue of muscle strength and flexibility are important considerations: their rationale though, is the obverse of current legislation, (ie, fitting the job to the worker). It is certainly in the worker's interest to be fit and healthy, but it should not be the school's sole direction. Research and legislation highlight the importance of ergonomic assessment based on risk management. There must be an analysis of work stations and work practices, with a view to modification should they be warranted. This, together with fitness programs would result in a comprehensive proactive approach and it is these areas that the school needs to address for their future.

The results of the manual handling risk assessment (Figure 4.4.1.1.) indicate numerous areas the school legally must investigate further. It is important to prioritise these areas as it is not possible to address them all in a short time period.

Recommendation 10

The O.H.&S. committee develops an action cycle designed to reduce the identified risks of manual handling (based on further investigation of the responses to the risk assessment conducted as part of the final questionnaire).

While acknowledging that the school needs to consider all aspects of an effective safety program, particularly an emphasis on fitting the job to the worker (and not the worker to the job), there is research (Epes 1994; Timiras 1994; Kerr & Vos; Shi 1993; Wachsman & Swanson 1992; Zechetmayr 1992) to suggest that the staff at the school would greatly benefit from continued fitness programs being offered. Only one respondent indicated they were eager for a re-introduction of the exercise classes and the school's O.H.&S. committee should investigate reasons why these classes initially folded

together with what could be improved upon for the future. In order to provide staff with the opportunity to improve their physical fitness, the following recommendation is made.

Recommendation 11

The school continues to provide ongoing fitness opportunities.

The beginning of the school year in particular can be a very physically demanding time for staff. They return from 6 weeks annual leave, and may be either new to the school or new to a class that requires extensive manual handling. Often two staff members have not worked together before, and have not had prior opportunities to practice their 'team lifting'. The staff on those classes where all of the students are highly dependent and difficult/awkward to manually handle may well be required to complete as many as 300 manual handling actions on a single day (see Table 4.4.4.1).This invites the possibility of sustaining an injury, and it would be valuable to spend significant time each day building up fitness prior to this many episodes of manual handling. There is evidence to suggest that muscles need to be 'hardened' after a break of a few weeks (Gunsch 1993). One large corporation in America found a reduction in the incidence of musculoskeletal injuries for workers on a car assembly line when they spent their first two weeks after a long break working at 50% input with the remainder of their time spent on improving staff fitness levels and increasing manual dexterity.

Recommendation 12

That the school consider a staggered start in the first week of school each year, on those classes where staff will need to perform high levels of manual handling.

While the issue of physical compatibility when team lifting was mentioned by one respondent in questionnaire one (Appendix Q, Q 25) and only received a cursory mention amongst literature (Qld Nurses Union 1991), there is a school of thought that believes it is important for two people to be of a similar physique when completing manual handling with each other.

Recommendation 13

That the staff discuss its views on the value of assigning two physically compatible staff members onto a class which requires extensive manual handling.

The school is large and busy. Not all staff are aware of what is occurring in different sections of the school due to their own hectic schedules. For this reason it is important the school prepares and distributes essential documentation relating to the school's safety program. This will allow new staff to quickly identify the key components of the safety program, and allow the ongoing staff to absorb this information on a flexible 'needs' basis. It will also allow staff to identify O.H.&S. as a priority area in their school. It is for these reasons that the following recommendation is made:

Recommendation 14

The school's O.H.&S. committee develop a staff orientation program in the area of manual handling.

One way to implement the current legislation's rationale is for the school to purchase equipment that is adjustable in nature. While many of the lifting, carrying, actions are for short periods of time, others are for longer periods. Each day staff have to feed many severely disabled students. These students are in assorted types of equipment and each student is of a different size and nature. Staff feeding these students all sit on standard (non-adjustable)

regulation 'teacher chairs'. Staff themselves come in various heights and sizes. There are frequent instances where staff postures are twisted and bent with their arms abducted for periods longer than a few minutes at a time. It would greatly benefit the staff at the school if all equipment purchases were made with an ergonomic orientation, thus allowing for less stressing of individual staff members' musculoskeletal systems. As the school currently operates in a team structure with members responsible for various programs and their inherent resources, it is important for all staff members to note the following recommendation.

Recommendation 15

That consideration be given by the school staff when purchasing equipment that it be adjustable in nature as well as manoeuvrable to allow for each student and staff member to have their physical needs met.

Due to the size of the school, and the diversity of its students, not all staff are aware of what mechanical equipment the school has previously purchased to assist in the reduction of manual handling. Staff may be unaware of how to use it effectively, as well as where it is currently housed. Therefore, some mechanical equipment may be underutilised, with some staff members manually handling more than they need to. The potential for injury may well increase in proportion to equipment underutilisation. Therefore the following recommendation is made:

Recommendation 16

The school establish a register that details the mechanised equipment available to staff to assist them with their manual handling. This register should state where this equipment is housed, together with how to use it. The O.H.&S. committee should be charged with the responsibility of maintaining this in an up-to-date form, and ensuring that all staff (including casuals and new staff) receive a copy.

5.2.4. Training and Development

The school currently has a voluntary approach in all matters germane to O.H.&S. Fitness classes and lifting sessions are all via voluntary attendance. It is possible for staff to not attend. Furthermore it is plausible for casual, part-time and voluntary staff to be unaware of the existence of these sessions. There needs to be training for all staff, in solo manual handling, as well as in team situations. While the school is endeavouring to reduce the amount of manual handling that staff members have to perform, due to the nature of the school and its students, it is not likely that manual handling will ever be eliminated. The school must devise a system that provides formal instruction in recommended manual handling techniques to all staff members.Some staff members will need to change their attitudes and o/r work practices given that they continue to work after sustaining an injury. Others perceive themselves too busy to; stop working, exercise, or prepare their muscles. Also, few staff members responded that they had altered their work practices as a result of sustaining an injury. This must be addressed via training and development sessions. It is important for staff to demonstrate their understanding towards sustaining an injury and the active role they can adopt in controlling injury incidence.

It is crucial for staff to determine the correct method of response should they

sustain an injury as well as act proactively to reduce/eliminate the likelihood of injury. Some injuries will not require staff to stop working, others may appear trifling at first. It is important for staff to realise that it is preferable to spend a small amount of time addressing a minor injury than 'hoping' it will sort itself out and be better by tomorrow.

Recommendation 17

That the O.H.&S. committee ensure that the school conducts regular workshops on the DSE recommended manual handling approaches at times which are suitable for all staff to attend.

Training and development is only successful if it achieves the desired outcome. At Wattle St SSP it is crucial that all staff demonstrate a high level of proficiency in manual handling techniques. Therefore, it would benefit staff to analyse their techniques, in both the individual and team situation to see if it was possible to suggest improvements in these areas. Previous studies have shown that 'professional lifters' rarely used the squat lift correctly (Kuorinka et al 1994;Trafimow et al 1993). Therefore, analysing techniques may have far reaching consequences, particularly if they assist in the elimination of a single injury. While the following recommendation is time consuming, its potential benefit justifies its implementation.

Recommendation 18

That the O.H.&S. committee consider analysing current staff manual handling habits & practices.

Over the years the school has regularly purchased mechanical equipment to assist staff in handling students. However, some staff members would not be aware of all of the available mechanical equipment and how to use them.

Therefore, the following recommendation is made with particular emphasis for the beginning of the school year, or after a new piece of equipment is purchased.

Recommendation 19

That the O.H.&S. committee organise regular staff workshops to revisit the correct usage of current and new equipment.

5.2.5. Data Organisation

The school's senior management has compiled and retained all injury records completed by staff over the previous years. It should be noted that the school is especially vigilant in this respect and all staff are actively encouraged to complete an injury form, should they become injured.

Prior to this research the school has not previously analysed any of its records pertaining to staff injury. This is due to three main reasons. The school's senior management is concerned with the issue of staff privacy, the South Coast Regional Office did not ever communicate to the school the DSE's recommended approach of schools analysing their injury records quarterly, and finally no-one ever showed the committee how an analysis could be done.

The only conclusion that can therefore be made is that these records are primarily kept for legislation, litigation and payment purposes. As such it is an example of minimum standard and certainly not Best Practice. This raw data is a crucial source of valuable information to any organisation implementing proactive safety programs.

It is in the staff's interest and only in their interest that these records be

analysed as they may reveal trends and help determine crucial information. Information may emerge highlighting such areas as; the nature of injuries; the time and place of injuries; the injury agency; whether injuries occur more at the beginning or the end of a day; whether some days/1 day is more /less prevalent in terms of injury occurrence. Without this information analysis, the staff will only ever be able to speculate the level of O.H.&S. injuries the school is experiencing.

Given the school senior management's reluctance to allow scrutiny of the injury records at Wattle St SSP they, along with the school's O.H.&S. committee must therefore be made fully aware of Section 25 (1) of the Occupational Health and Safety Act NSW 1983 as well as the Occupational Health and Safety (Committees in Workplaces) Regulation 1984, Regulation 13 (1) (d) which states:

> "Committees shall have power...to have access to all information kept by the employee -
> (i) relating to accidents and occupational diseases occurring at that place of work; "

Now that the school is aware of DSE policy towards risk assessment and the value of regular and accurate statistical processes,it is crucial that the O.H.&S. committee devote some time and effort in using the information from the injury records to assist them in their action plans.

> **Recommendation 20**
> That the school allocates time to members of the O.H.&S. committee to analyse its injury records (for the previous 5 years) as a matter of urgency.

The school may wish to use tally sheets such as Appendix XA to achieve this, or develop their own sheets. It is important that they analyse frequently as well

as on a regular basis, as this will provide them with an accurate measurement of how effective their strategies are, as well as monitor the need for readjusting strategies.

Recommendation 21

That part of each O.H.&S. meeting be devoted to the discussion of injury tallies.

Given that research highlights the effectiveness of employee participation and teamwork in reducing O.H.&S. injuries, it is important for all pertinent information to be communicated to staff members on a regular basis, by the O.H.&S. committee. This way all staff members are not only aware of the current situation but, they are also in a position to assist the committee.

Recommendation 22

That injury tallies be communicated to staff via the O.H.&S. meeting minutes as well as during staff meetings. The committee should decide whether it wishes to use trends or actual figures.

Currently the school houses injury records in a loose leaf folder. The NSW O.H.&S. Act of 1983's Regulation pertaining to Notification of Accidents 1990, Regulation 10 states this as legally acceptable.The system is however, an easy way for forms to become disordered, or sheets may be lost, deliberately misplaced and/or inserted. This in turn then may adversely affect the accuracy of data analysis in general, while inducing stress for individual staff members, should their records be displaced. Therefore, the staff at the school may consider implementing the following recommendation:

Recommendation 23

That the staff discuss the value of purchasing the WorkCover Authority's Injury Book (for major injuries), together with devising a more secure method of entering minor injury/disease reports.

5.2.6. Role of Management

The role of the school's management is pivotal in the implementation of any safety program (Hansen 1993). The priority safety is assigned by them, together with the resources they allocate to the development and implementation of programs are tangible methods that allows all staff to view the value that management places upon the program.

Thus far the school's management has implemented fitness programs and purchased mechanical equipment to assist staff with manual handling. Therefore the focus has been on improving staff fitness and reducing the amount of manual handling that occurs.

Management's challenge now is to prioritise safety management together with an appropriate and achievable program, that effects change across the school staff.

It is important for the school's senior management to demonstrate their ongoing commitment to effective safety programs. This commitment needs to be presented in several tangible ways. One of these is the adoption of a continuous improvement cycle of risk control that acknowledges the problems associated with O.H.&S. in general and manual handling in specific as not 'fixed' in a single attempt. Each identified risk may well require different forms of risk control (see Appendix B). Not every intervention strategy will reduce the risk every time. Even if it does, the school will need to constantly revise what

constitutes an acceptable risk. Therefore, the following recommendation is made.

Recommendation 24

The school's management tangibly demonstrate their support for O.H.&S.

5.2.7. T.Q.M. Approach

Total Quality Management is a suitable infrastructure within which to implement an effective safety program. Key principles such as customer focus and process orientation are already incorporated into the O.H.&S. approach, simply because it is not plausible to separate them from effective O.H.&S. management.

Research highlights the value of teamwork in the area of effective safety programs. Of the two models presented, establishing teams to identify problems, and their solutions in a collaborative manner, is the most suitable for the school. The creation of teams ensures high levels of staff participation which in turn greatly facilitates the implementation of effective safety programs. Not only are more people able to collect, group and analyse information, but, it will develop staff ownership though greater understanding of the issues, together with viable control systems inherent to their jobs.

Recommendation 25

The school incorporates risk identification into their existing team operation.

5.2.8. O.H.&S. Committee

While the role of the O.H.&S. committee is that of an advisory body, there are many functions it can perform. As committee members become more

knowledgeable about O.H.&S., they will be in the prime position to develop a vision as well as action plan for the school (Appendix C). As such they are crucial to the successful development, implementation, monitoring and evaluation of the school's safety program. In order to sustain their development it is crucial that they continue their own professional development in the area of O.H.&S. This may be achieved professional reading, continued research, networking, and attending industry inservices such as the current BackWatch series.

It is important for the O.H.&S. committee to continue to resolve all of the matters identified in the school's recently conducted risk assessment. Should they find themselves unable to control all of the risks identified they should fully acquaint itself with Section 24 (1b &c) of the Occupational Health & Safety Act 1983 NSW, and implement the following recommendation.

> **Recommendation 26**
> Pursuant to Section 24 (1 b&c) of the Occupational health & Safety Act 1983, Wattle St SSP invite The WorkCover Authority of NSW to conduct an inspection of the workplace for the purpose of resolving matter raised in the school's risk assessment.

5.3 NSW Department of School Education

Throughout the course of this research it became increasingly apparent that the DSE has a low priority in relation to proactive O.H.&S., and currently considers the extensive O.H.&S. statistical data it collects to be 'sensitive' and not for release. Given the adverse publicity that surrounded teacher stress data released to the media in July 1995, and the resultant pressure the DSE received, it is possible to comprehend the DSE's reluctance. It begs the

following question though: if it realises that the data is damaging, then why does it not address the issue in an effective manner? This is all the more perplexing when you consider the development of their comprehensive Risk Management Awareness Package (Appendix A). In fact, it could be argued that the DSE is not following legislative guidelines in relation to fitting the job to the worker. They currently expect the worker to fit to the job.

The DSE is an excellent organisation providing quality resources to allow quality teaching to occur. However, this is not presented within a total quality paradigm. It is not possible to ensure that students receive quality teaching, without ensuring that all the needs of employees are being met. To date the focus has been on skilling teachers in the area of quality teaching and students' learning styles. O.H.&S. awareness is low. The DSE must be aware of the injury rates at Wattle St SSP, yet it has provided the most minimal support that it must legally provide.

The policies and practices of the DSE impact tremendously within each school. When it became apparent that the DSE was reluctant to supply O.H.&S. statistical data for this research, Wattle St SSP's senior management similarly followed this approach. Therefore, it can be said that (in at least one instance and probably more) principals in schools see their role as implementing DSE policy, instead of developing the policy most suitable to meet the needs of their school. This approach is in line with the strong culture within the DSE. It may however, be detrimental to schools, particularly the staff at the schools.

5.3.1. Knowledge

The Department of School Education's Risk Management Package of 1993, demonstrates that it is comprehensively aware of the current O.H.&S.

legislation. Through its Manual Handling Memo (Ailwood 1995 a) it is also apparent that the DSE is cognizant of the current manual handling focus. In the South Coast, the memo was widely circulated, the Risk Management Program was not implemented at all. After viewing both documents, it is doubtful whether school managements and/or O.H.&S. committees could effectively implement the memo without the risk management package.

Recommendation 27

The DSE (in the South Coast Region) inservice all existing principals in the area of Risk Management, and make provision for all new principals to be inserviced immediately prior to their appointments.

5.3.2. Ergonomic Program

The Department of School Education in NSW is not implementing the current O.H.&S. legislative focus of ensuring the job is fitted to the worker. This could provide a basis for future litigation, as well as restrict the effectiveness of schools' safety programs. Research shows that effective safety programs save money, and increase the quality of work. This makes their reluctance the more perplexing. It is imperative that the DSE implement the following recommendation.

Recommendation 28

The DSE acknowledge O.H.&S. as important by requiring all schools to implement risk management strategies, in line with existing legislation.

5.3.3. Injury Data

The current approach of restricting analysed O.H.&S. data, is gross underutilisation of a valuable resource. In order for each school to monitor their individual performance in this area, it would be beneficial for the DSE to

distribute O.H.&S. analyses to schools on a regular basis.This would allow schools to contrast DSE trends over time, as well as compare their school in relation to the DSE as a whole.

Recommendation 29

Each school receive quarterly DSE O.H.&S. trends data.

5.3.4. Training and Development

Under Section 25 (2) of the NSW Occupational Health & Safety 1983 members of O.H.&S. committees are to be provided with training to "assist him to exercise his functions as such a member". What the Act does not stipulate is how long members 'should' wait before they are trained. Non training attracts a maximum penalty of 50 points. The chairperson of Wattle St SSP's O.H.&S. committee has been waiting since February this year to be trained. As the DSE does not allocate sufficient funds to meet training needs, the current practice in the South Coast Region is to ensure that at least one member of each formal O.H.&S. committee is trained in O.H.&S. (Ailwood 1995 b).

Recommendation 30

All formal members of an O.H.&S. committee be trained within the period of their appointment to the committee.

Given that three of the current O.H.&S. committee at Wattle St SSP have been trained in O.H.&S., and that this training was insufficient to fully meet the school's information needs, the following recommendation is made.

Recommendation 31

At least one member of each O.H.&S. committee attend advanced training in O.H.&S.

The current direct cost of O.H.&S. in the DSE is possibly as high as $50 million per annum (see 4.8.1.). The total costs could be between $150 - $350 million per annum. Given that research cites the numerous benefits associated with effective safety programs (and financial gain is certainly one of these), this money could be put to better use. Therefore the following recommendation is made.

Recommendation 32

The NSW Department of School Education prioritise proactive O.H.&S. programs across schools and districts.

5.3.5. Schools and Managers

The Scott Report (1990) identified the need for the DSE to invert its focus from a centralised bureaucracy supported by schools, to a system of devolved schools where the central system supports individual school needs. This has not happened in the area of O.H.&S.

Recommendation 33

The DSE fully adopts the Scott Report's recommendation that the system's function is to support schools, and acknowledge that this includes the area of O.H.&S.

School managements do not currently have an active, or significant role in relation to O.H.&S. It is Head Office which determines policies and pays the majority of direct costs. School managements are not fully informed of O.H.&S. legislation, or provided with the resources necessary to implement effective safety programs. Yet it is the schools that directly experience the effects of decreased job satisfaction, morale and the impact these may have on workplace culture and productivity. The DSE employs personnel across

different types of workplaces, each with different needs. It is predominantly in schools for specific purposes (SSP's) that manual handling would be an issue.

Until the school's management is completely responsible for O.H.&S., there is limited incentive for them to take responsibility for their employees being injured or contracting diseases.

Recommendation 34

The responsibility of O.H.&S. be completely devolved to individual workplaces.

Recommendation 35

The NSW Department of School Education monitor the effectiveness of school based O.H.&S. programs .

Given the lack of O.H.&S. training that school senior managers receive, they currently do not have the skills and knowledge necessary to effectively implement the above recommendations. Devolving O.H.&S. would require extensive support (both financial and human) to some schools. In Wattle St SSP where staff sustain significant body stressing injuries simply because they are doing the job that the DSE developed for them, this support is imperative.

5.3.6. O.H.&S.

Given that legislation in the area of Occupational Health &Safety is relatively new, it is reasonable to expect that some organisations are still operating at what Crosby calls the Uncertainty Stage (Appendix C), while others will have moved through to the stages of Wisdom and possibly even Certainty. The Department of School Education in NSW appears to be at the Uncertainty

Stage. This may simply reflect the Public Service's lack of emphasis on employees needs (Baker 1989), or it may be that the current incidence rate of workplace injuries and/or diseases is not not deemed severe enough to warrant greater priority.

5.4 NSW Government

The current legislation in NSW is adequate to meet the needs of employees. Input from discussions with inspectors employed by the WorkCover Authority of NSW, suggest that the current emphasis in this State is on collaboratively assisting employers to implement effective safety programs that meet the needs of each workplace, rather than looking for revenue through breaching organisations and/or individuals. This current emphasis however, has not yet been evaluated to determine if the approach is effective in changing workplace systems and work stations.

Unfortunately approximately 68% of schools in the South Coast Region are ineligible to form a formal O.H.&S. committee. The rationale behind the legislation's minimum 20 employees to form a committee is unknown. It does however, have significant implications when most SSP schools are too 'small' in staff numbers to form a committee. This means that the DSE will not pay for O.H.&S. training, and these schools may have significant O.H.&S. injuries from manual handling.

Recommendation 36

The NSW government amend current O.H.&S. legislation to allow workplaces of less than 20 employees to form an O.H.&S. committee, where the majority of staff request the aforementioned committee's formation.

5.5 Research Aims and Objectives

There were eight research objectives outlined in Chapter One and two aims outlined in Chapter Three.

The first aim was that that staff who participated in an intervention program aimed at strengthening and warming their muscles prior to lifting would reduce the incidence and severity of their musculoskeletal injuries. It is not possible to determine if this aim was achieved due to the poor response rate of questionnaire two. The second aim was that staff would implement a continuous improvement process to continue their pursuit of workplace injury reduction. This aim has not currently been achieved. The O.H. & S. committee at the school will decide upon the benefit of this approach at the conclusion of this research using it as the basis for their decision.

The first objective pertained to determining the extent of the school's injuries - past as well as current. This objective was only minimally achieved. While the school released information for a six month period and confirmed information about major injuries throughout the 1994/95 fiscal year, no other information was released by them.

The second objective was to determine the cause of injuries to staff. Questionnaire one and the school's released injury information showed that over 70% of their workplace injuries were body stressing due to manual handling. Therefore objective two was achieved.

Objective three looked at determining external support for the school. This was achieved through literature analysis, The NSW Workcover Authority as well as The Worksafe Authority. Objective four looked at a literature analysis which is

contained in Chapter Two. It too was achieved. Objective five addressed the requirements and merits of current practises in manual handling. It was possible to determine the legal and ergonomic requirements of current practices through information from the above authorities as well as research analysis, and so this objective was achieved.

Objective six pertained to analysing the current practices in the school in relation to manual handling. The objective was only partially achieved. Information from questionnaire one showed that some staff continue to work after sustaining an injury, as well as showing that staff sometimes take sick leave instead of W.C. leave. It also showed that few staff have altered their practices in manual handling once they have been injured. The research did not however, determine how staff are actually manually handling, that is, whether they are using the stoop or squat lifting techniques, or some other version.

Objective seven looked at the legal requirements of manual handling. This was achieved through synthesis of Worksafe Australia's Manual Handling "National Standard [NOHSC:1001(1990)] and National Code of Practice [NOHSC:2005 (1990)]" book and the risk assessment component of questionnaire two.

The final objective of this research was to provide the school with a process for their ongoing needs in reducing manual handling injuries. This has been achieved through introducing the school to techniques such as Kaizen (Appendix M), some data analysis tools (Appendix L), the DSE's risk management process (Appendix N), developing data analysis sheets (Appendix XA), and developing an action plan (Appendix O) for the school. The school also has a management matrix (Appendix C) upon which to

develop its future O.H.&S. goals and practices.

Therefore of the eight research objectives a total of six were achieved with objectives one and six only partially achieved.

5.6 Summary

Schools have always been about teaching and learning. Students have always been the vital participants, and this is not disputed here. Student needs are of optimal importance. Staff needs however, have been viewed predominantly in terms of teaching content and style.

Maslow's Hierarchy of Needs does not have empirical evidence to support it (Robbins 1993), yet many educators would argue that it is important for students to have their lower order needs (physiological and safety) met before they can engage in quality learning. To achieve this end there are schools which provide breakfast to students (who may not be receiving a nutritious one at home), while most schools provide welfare programs to address student self-esteem together with strategies to protect themselves from harm (physical as well as emotional). This is exactly what Maslow would say is required (Robbins 1993). If this is valid for students, why would it not be so for staff? If staff are not protected from physical and emotional harm, how can they engage in quality teaching?

Students' welfare and safety needs are incorporated into every school's program, but staff safety and welfare is not adequately addressed. The reasons for this are not known.

There is one aspect of culture that is vital for the school to consider. It is

important for staff to value their needs, not just the needs of their students. Achieving this shift in attitude and practice is difficult as Feldstein (et al 1993) discovered when reporting on culture changes in nurses towards their patients. Similarly, putting students first is as deeply entrenched in educational culture as putting patients' needs first is in nursing. In education it stems from a combination of the legal obligation through 'Duty of Care', parenting practice in the form of in 'loco parentis', and the human nature reaction of stopping a defenceless child from hurting themselves, if at all possible. This change in attitude and behaviour will take the staff many years to accept and even more to implement.

The most valuable asset to any organisation is its human resources (Kohn & Friend 1993). Unfortunately all too often within the public service it is the employees whose needs are ignored (Baker 1989).

T.Q.M. is ideal for safety management as both rely on

- Continuous improvement
- Customer focus
- Use of statistical process control
- Teamwork
- Employee participation - empowerment
- On-going process
- Everyone shares the same values
- Eliminate the waste- develop proactive measures so that it is done correctly the first time.
- Flexible approach

Worksafe Australia believes that O.H.&S. in Australia is improving (Worksafe 1993 a), while the Industry Commission (1995) does not. Either way, more

injuries and diseases are compensable than ever before (Petersen 1994), which possibly helps to explain why O.H.&S. costs have tripled in the last decade (Perry 1994). Body stressing injuries in NSW continue to increase, with the WorkCover Authority of NSW listing it at 37% of injuries compensated in the 1993/1994 financial year. In the same time period back injuries accounted for 31% of W.C. claims. Of these body stressing injuries, most are due to lifting and carrying.

Research findings show that fitness is a key factor in reducing / minimising musculoskeletal injury and it is important for the school to continue to offer this program for all staff. However, it is only one of the directions that the school should be moving in. There needs to training for all staff, in lifting solo, as well as in team situations. There needs to be job re-design. These need to be an ongoing needs assessment and risk control measures in operation.

There is no denying that lack of on site access to the school was a major limitation for this research. It was not possible to discuss aspects of this research whenever some staff member had a query. Staff are very busy and there was no-one on site to remind them of the various questionnaires or to explain any queries that staff may have had. It was not possible to use the art of gentle persuasion.

This research achieved most of its objectives. It has provided Wattle St SSP's O.H.&S. committee with sufficient information to facilitate their decision making and planning in order to reduce their injury rates.

O.H.&S. should be viewed in a positive light. It should not be about blame, trying to discern who didn't do what. It is counterproductive to blame anyone (Krause 1994). It is about establishing a starting point, problem solving and

asking why. The Crosby Management Maturity Grid (Appendix C) is particularly useful in this respect. It allows an organisation to determine its starting point and provides useful stages along the way until it reaches its vision - where does it want to be in X years time. These stages can be viewed as scaffolding.

The school's current approach to O.H.&S. vacillates between Crosby's stages of Uncertainty and Awakening (Appendix C). The challenge for the school is to develop a time-line for achievable change, without experiencing over-load. While it is imperative that the school address their risk assessment responses (Figure 4.4.1.1), it is vital that it be done at a rate that is compatible with the total school community. They must also determine which areas the DSE needs to address because the areas are either systemic in nature, or because of the limited resources that the school has. Once this has been done the DSE must be informed about what the school requires of them.

The school must target achievable change, with the focus as fitting the job to the worker. It must strive toward this end using a quality process that incorporates continuous improvement and a customer focus.

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APPENDIX A

NSW Department of School Education

RISK MANAGEMENT AWARENESS PROGRAM

SYNOPSIS

4 hour inservice for school principals OR 3 day train the trainer program

A Principles of Risk management
1. Overview of risk
2. Definition of risk management
3. Risk management process

B Treasury Managed Fund
1. Principles of the treasury managed fund

C Responsibility for Risk Control
1. Overview of responsibilities
2. Responsibilities under common law
3. Responsibilities under statutory law
4. Responsibilities under departmental policy
5. Practical risk control activities for principals

D Risk Management in Practice Workshop
1. Objectives of workshop
2. Examples of risks in schools
3. Workshop exercise

E Benefits of Risk Management

Between 1989 and 1992 annual losses incurred for property were in the order of $18 million

Examples of risk
1. Risk of school being vandalised
2. Risk of injury to staff, students
3. Risk of harm to authorised and unauthorised visitors
4. Risk of picking up the H.I.V. virus
5. Risk of fire to whole or part of school
6. Risk of theft
7. Risk of storm/water damage
8. Risk of being burgled
9. Risk of assault

Total Costs

Example used is a science experiment injury

Recoverable

Workers compensation
Medical Expenses

Irrecoverable

Impact on students
Disruption to injured students' program
Disruption of curriculum program
Impact on staff
Orientation of replacement teacher
Interruption to school routine
Investigation and administration time
Clean up time
Impact on school image
Impact on principal's image

No way to recover the irrecoverable costs and may be far in excess of the recoverable costs.

Prevention is the desired alternative.

By being an 'ostrich' nothing much is achieved. The only effective technique is to apply risk management principles.

> RISK MANAGEMENT
>
> is management practices focussed on
>
> minimising losses and their effects

Risk management application is for principles to

- Identify risks
- Analyse and measure risks
- Control risks
- Monitor controls and results
- Apply corrective strategies

RISK IDENTIFICATION TECHNIQUES

1. Review of loss data
   - used to determine trends
   - determine areas to be rectified
   - analysis can provide frequency, cause, time etc.
   - data can be applied to corrective action
   - used for foreseeing risks/hazards and risk controls
2. Inspections/discussions (can be formal or informal)
   - permits foreseeable risks
   - deficiencies in equipment and buildings
   - improper actions by staff and students
   - the effects of changes
   - inadequate remedial actions
   - commitment by principals and managers

3. Brainstorming
   - effective in incident imaging
4. "What if..." questioning
   - process does not qualify or quantify the risks they are simply nominated and the
     consequences discussed.
5. Surveys/ questionnaires
   - used to highlight deficiencies in procedures, inspections systems, products of
     intellectual assets etc.
6. Use of specialists
   - both internal and external to provide expertise in risk identification
   - principal should be the specialist , but may desire assistance.

THIS APPROACH HAS A MAJOR DEFICIENCY IN THAT THE LOSS HAS ALREADY OCCURRED.

Use of
- Risk Control
- Risk Retention and Financing
- Risk Transfer or insurance

Monitoring
- examine W.C. statistics
- examine property loss statistics
- examine liability claims
- compare current losses with those of previous years
- ensure risk recognition inspections are being done
- ensure risk control procedures are still being followed
- ensure all losses are being reported
- ensure insured values are adequate to cover replacement
- ensure new staff receive adequate introductions, training, etc.

MEASURE THE LOSSES
CHECK THAT THE CONTROL SYSTEMS ARE WORKING

The fact that losses have been incurred indicates that either:
* a risk has not been recognised, or
* a control system has failed and correction is needed

A more proactive approach to the monitoring process is to regularly check the risk control strategies and implement modifications as deficiencies are observed.

REGULAR MONITORING IS ESSENTIAL TO SUCCESS

TREASURY MANAGED FUND
covers losses incurred by

- Workers Compensation
  medical costs and staff salaries
- Property
  costs of buildings, equipment and supplies. Event could be fire, vandalism, theft or storm damage.
- Legal Liability
  Costs of settlements or awards relating to legal damages or prosecution
- Miscellaneous
  Cover losses incurred by embezzlement etc

Fund split into two components

1. Regions Managed Fund allocation (pays up to the first $30 000 of each claim
2. Treasury Pool pays remainder of the claim from the GIO as the Fund Manager.

GOVERNMENT POLICY IS TO LET THE MANAGERS MANAGE. The responsibility is thus placed upon the principals to :

- identify risks
- analyse and measure risks
- control risks
- monitor control systems
- correct systems as necessary to minimise losses

Principals' Risk management Responsibilities
Protection of :

- Departmental Assets
- Staff and student health & safety
- Departmental liability

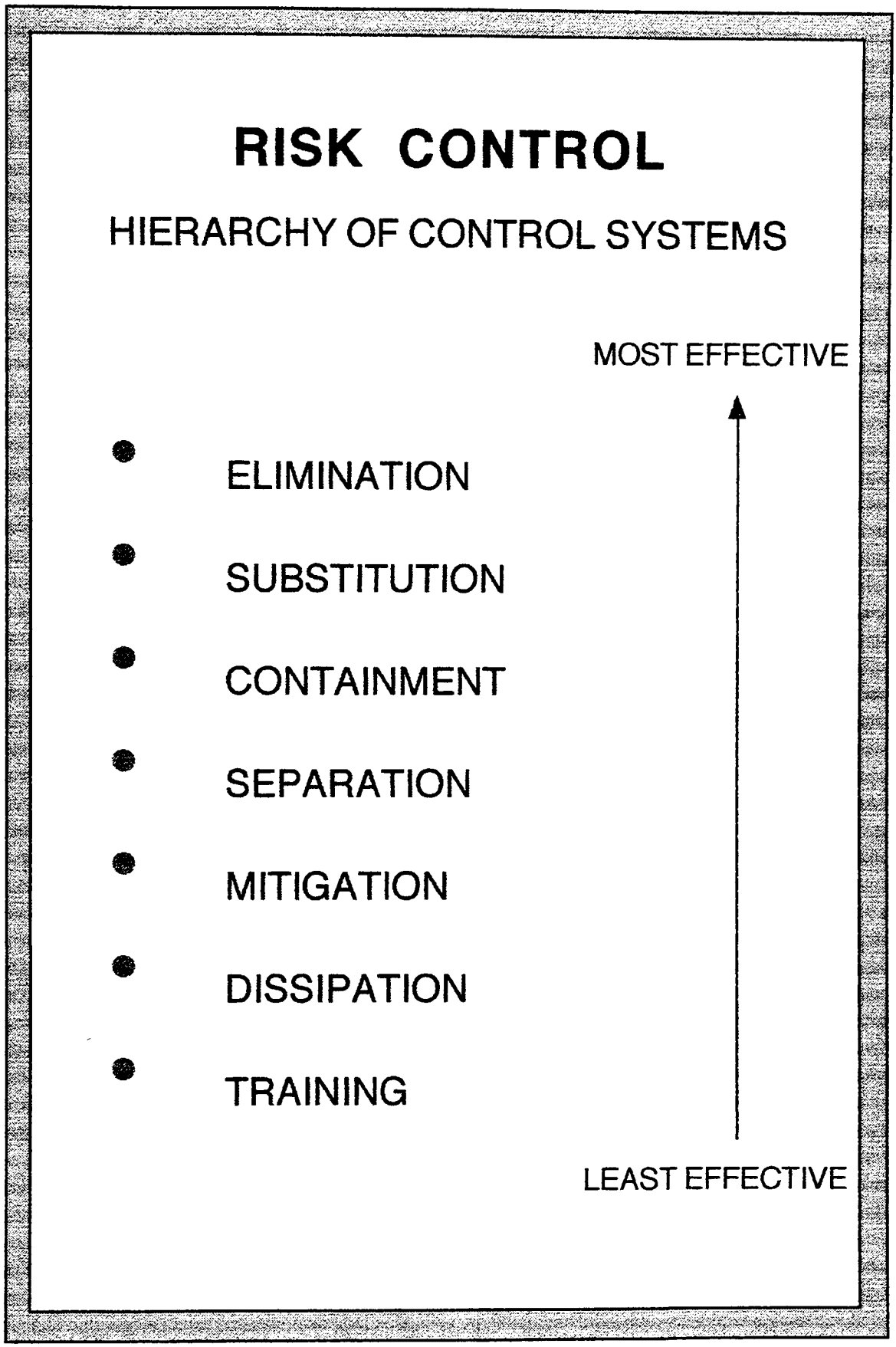
The Director-General has published a policy on risk management which places responsibility on every employee to

"identify, quantify and control loss exposures"

RISK MANAGEMENT EXERCISE

Identify and describe the risk
Evaluate the risk (Consider all losses and disruptions)
Describe the risk control strategy (Use the hierarchy of controls)
Describe the monitoring systems (Do not set and forget)

Source DSE Risk Management Package 1993



Source NSW Department of School Education Risk Management Awareness Program OHT 2.12

QUALITY MANAGEMENT MATURITY GRID

Measurement Categories	Stage 1 Uncertainty	Stage 2 Awakening	Stage 3 Enlightenment	Stage 4 Wisdom	Stage 5 Certainty
Management understanding and attitude	No comprehension of quality as a management tool. Tend to blame quality department for 'quality problems'	Recognising that quality management may be of value but not willing to provide money or time to make it happen	While going through quality improvement program learn more about quality management; becoming supportive and helpful.	Participating. Understand absolutes of quality management. Recognise their personal role in continuing emphasis.	Consider quality management an essential part of company system.
Quality organization status	Quality is hidden in manufacturing or engineering depts. Inspection probably not part of organization.	A stronger quality leader is appointed but main emphasis is still on appraisal & moving the product. Still part of manufacturing or other.	Quality dept. reports to top mgmt, all appraisal is incorporated & manager has role in management of company.	Quality manager is an officer of company; effective status reporting & preventing action. Involved with consumer affairs & special assignments.	Quality manager on board of directors. Prevention is main concern. Quality is a thought leader.
Problem Handling	Problems are fought as they occur; no resolution; inadequate definition; lots of yelling and accusations.	Teams are set up to attack major problems. Long-range solutions are not solicited.	Corrective action communication established. Problems are faced openly and resolved in an orderly way.	Problems are identified early in their development. All functions are open to suggestion and improvement.	Except in the most unusual cases, problems are prevented.
Cost of sales as % of sales	Reported unknown. Actual 20%.	Reported 3% Actual 18%	Reported 8% Actual 12%	Reported 6.5% Actual 8%	Reported 2.5% Actual 2.5%
Quality Improvement actions	No organised activities. No understanding of such activities.	Trying obvious 'motivational' short-range efforts.	Implementing the 14-step program with thorough understanding & establishment of each step.	Continuing the 14 step program & starting Make Certain.	Quality improvement is a normal & continued activity.
Summation of company quality posture	'We don't know why we have problems with quality'.	'Is it absolutely necessary to always have problems with quality?'	'Through mgmt commitment & quality improvement we are identifying & resolving our problems.'	'Defect prevention is a routine part of our operation.'	'We know why we do not have problems with quality".

SOURCE: Quality is Free Philip B Crosby 1980 pp32-33

QUALITY MANAGEMENT MATURITY GRID MODIFIED TO O.H.&S. FOCUS IN DSE

Measurement Categories	Stage 1 Uncertainty	Stage 2 Awakening	Stage 3 Enlightenment	Stage 4 Wisdom	Stage 5 Certainty
Management understanding and attitude	No awareness of O.H.&S. as a management tool. Tend to blame staff for not doing the right thing. Pay bills & complain cost is too high.	Recognising that O.H.&S. management may be of value but too busy to make time for it to happen. Not prepared to pay for risk mgmt programs.	Learn about the value of risk mgmt programs. See need for long term commitment; becoming supportive and helpful.	Participating. Understand developing OHS. vision for the organisation. Risk mgmt implemented, teams proactive emphasis.	Consider O.H.&S. management as the cornerstone of a quality organisation.
Quality organization status	Quality is described in teach--documents. Quality teaching is an aim of the organisation.	Consultants appointed in the areas of basic skills to assist teachers in their development of improved teaching skills.- Ratio 1: 5000 teachers.	Extra consultants appointed. Ratio 1 : 1200 . Some quality teaching outcomes expected Awareness developing re quality management in school executive .	Quality learning needs-quality mgmt & teaching Both achieved through Continuous improvement program implementation.	Quality manager in each District. Comprehensive quality mgmt focus.
Problem Handling	No problems perceived in DSE.	Consultative model. Staff explain problem. Mgmt decide before problem explained. Important to listen but mgmt are the experts. Know best.	Collaborative problem solving established. Problem acknowledged openly and solved using all staff talents.	Problems are identified early in their development All staff openly encouraged to suggest improvements.	Most problems preempted On rare occurrences dealt with particip. & alacrity.
Injury & Disease Incidence Rates[1]	Individual Schools unknown. Total Major :17.3 Minor 23.4	Individual Schools unknown. Total Major:15.1 Minor 20.8	Ind. Schools Major :19.5 -> 4.1 Minor 26.7 -> 8.3	Ind. Schools Major :9.6 -> 1.3 Minor 14.2 -> 4.2	Ind. Schools Major :2.1 -> 0.7 Minor 8.2 -> 2.7
Safety Improvement actions	Safety cannot be addressed. No interest in possibility other than ensuring no adverse publicity.	Appoint some counsellors to listen of teachers discuss personal problems . Develop risk mgmt, not implemented.	Devolve Safety totally to schools. Prioritise risk management. Intensive T&D for Principals.	O.H.&S. teams estab. in each school. Understanding that EVERYTHING is O.H.&S. based.	Continuous quality improvement with risk assessment every day activity.
Summation of company O.H.&S focus	Accidents happen. We don't really care. We pay the bills, we follow legislation. We are doing all we have to.	This is costing a lot of money. There must be a better way of managing this issue. Employees must be able to change their behaviour .	Risk Management is-proactive & it works.- How to pay to modify jobs to the worker, not the worker to the job.	Everyone focused on risk mgmt. Jobs modified, CQI cycles in operation. Reduction in injury & disease incidence.	We can tell you why our process works so well. Consistent reduction in injury & disease.

SOURCE: Headings & Outline adapted from Quality is Free Philip B Crosby 1980 pp32-33

[1] per 1000 staff members

QUALITY MANAGEMENT MATURITY GRID MODIFIED TO O.H.&S. FOCUS WATTLE ST SSP

Measurement Categories	Stage 1 Uncertainty	Stage 2 Awakening	Stage 3 Enlightenment	Stage 4 Wisdom	Stage 5 Certainty
Management understanding and attitude	No awareness of O.H.&S. as a management tool. Tend to blame staff for not doing the right thing. Pay bills & complain cost is too high	Recognising that O.H.&S. management may be of value but too busy to make time for it to happen. Not prepared to pay for risk mgmt programs	Learn about the value of risk mgmt programs. See need for long term commitment; becoming supportive and helpful.	Participating. Understand developing OHS. vision for the organisation. Risk mgmt implemented, teams proactive emphasis.	Consider O.H.&S. management as the cornerstone of a quality organ-. isation
Quality organization status	Quality described in teaching documents. Quality teaching is an aim of the organisation. Students are the only focus Rely totally on DSE focus and policy.	Recognise problem. Discuss with school's senior executive Sensitive area. Needs to be treated very cautiously. Look to DSE for guidance & support	Accept responsibility for school based decision making. Check with DSE that focus is compatible Saturate with information & train key personnel.	Use all school personnel to implement CQI process Highlight safety as an issue. Seek commitment from DSE re needs Invite Workcover in to assist in risk assessment.	All staff are safety officers. All trained in OH&S issues via train the trainer. CQI process effect-ive. Benefits tremendous.
Problem Handling	Only insurgent staff perceive problems. Mgmt doing their best.Dissidents not listened to	Consultative model. Staff explain problem. Mgmt decide before problem explained. Important to listen but mgmt are the experts. Know best.	Collaborative problem solving established. Problem acknowledged openly and solved using all staff talents.	Problems are identified early in their development All staff openly encour-aged to suggest improvement.	Most problems preempted. On rare occurrences dealt with particip. & alacrity.
Injury & Disease IncidenceRates[1]	UNKNOWN Injury stats not analysed	UNKNOWN but think they are too high	94/95 Stats Major :50 Minor: 166.7	94/95 Stats Major :33.3 Minor : 100	94/95 Stats Major :16.7 Minor : 66.7
Safety Improvement actions	Safety cannot be addressed. Its the nature of the job	Initiate exercise classes, some yoga, lifting sessions. Would be nice if staff attend Mgmt too busy to attend.	CQI to assess injuries. Injury stats analysis Approach reactive and proactive via risk mgmt	O.H.&S. teams estab. in school. Underst-anding that EVERYTHING is O.H.&S. based.	Continuous quality improvement with risk assessment daily occurrence.
Summation of company O.H.&S focus	Accidents happen. We blame the staff for not being careful or fit enough.	This is costing a lot of money. There must be a better way of managing this issue. Encourage employees to exercise to improve fitness	Risk Management really works.- How to pay to modify jobs to the worker, not the worker to the job.	Everyone focused on risk mgmt. Jobs modified, CQI cycles in operation. Reduction in injury & disease incidence.	We can tell you why our process works so well. Con-sistent reduction in injury & disease.

SOURCE: Headings & Outline adapted from Quality is Free Philip B Crosby 1980 pp32-33

[1] per 1000 staff members

Petersen's Management Safety Obligations

1. Concentrate on the long-range goal of developing a world class system, not on short-term annual accident goals.

2. Discard the philosophy of acceptable accidents - they are not acceptable

3. Use statistical techniques to identify the two sources of accidents - the system and human error.

4. Institute more thorough job skills training.

5. Eliminate dependence on accident investigation. Instead, use proactive approaches such as behavioural sampling, fishbone diagrams, flow charts, etc., to reveal system flaws and achieve continuous system improvement.

6. Provide supervisors (and employees) with knowledge of statistical methods (sampling, control charts etc) and ensure that these tools are used to identify areas needing additional study.

7. Reduce fear throughout the organization by encouraging all employees to report system defects and help find solutions.

8. Reduce accidents by designing safety into the process. Train research and design personnel in safety concepts.

9. Eliminate the use of slogans, incentives, posters and gimmicks to encourage safety.

10. Examine work standards to remove accident traps.

Source : Petersen D (1994), "Integrating Safety into Total Quality Management", Professional Safety, 39 (6), 29-30.

KRAUSE'S 8 PRINCIPLES

1. Have constancy of purpose.
2. Implement a process, not a program.
3. Do it right the first time.
4. Don't blame employees.
5. Specify standards in operational terms.
6. Use measurement of upstream factors to assess performance.
7. Improve the process, not the downstream results.
8. Use statistical techniques to distinguish common cause variation from special cause variation.

Source : Krause TR (1994), "Safety and Quality :Two Sides of the Same Coin" Quality Progress, 27 (10) 51.

COMPLETION IS VOLUNTARY,& ANONYMOUS [ ]

QUESTIONNAIRE

Please tick the appropriate box thus [√]
Information for statistical analysis purposes only.

---

1. SEX [ ] M [ ] F

2. AGE (in years) [ ] 20-24 [ ] 25 - 29 [ ] 30-34 [ ] 35-39
[ ] 40-44 [ ] 45-49 [ ] 50-54 [ ] 55 & over

3. LENGTH OF SERVICE within the Dept of School Education in Years

[ ] 0-4 [ ] 5-9 [ ] 10-14 [ ] 15-19
[ ] 20 -24 [ ] 25-29 [ ] 30- 34 [ ] 35 & over

4. Has your employment with the DSE been continuous [ ] YES [ ] NO

5. If No what was the (general) reason

_____

_____

_____

6. Length of current service at this school (in years) _____

7. Your classification is

[ ] Classroom teacher (including teacher librarian)
[ ] Cleaner
[ ] Clerical/office
[ ] Executive (Teaching)
[ ] Executive (Non-Teaching)
[ ] General Assistant
[ ] Teacher's Assistant

8. Is your position at this school
[ ] Permanent [ ] Casual [ ] Volunteer

9. Do you work [ ] Full time [ ] Part time
10. If not full time average number of hours worked per week_____

11. Have you ever been inured as a result of your work [ ] Yes [ ] No

If you have never been injured at work please go to Q 22

12. What were you doing at the time of you injury/injuries - or what were you doing when you first noticed that you had an injury (Use general categories eg lifting, feeding, bus loading, where relevant)

_____

_____

_____

_____

_____

(Should more room be required please use the back of this sheet)

13. Nature of your injury please tick more than 1 box where necessary

[ ] sprain/strain
[ ] mental
[ ] laceration
[ ] contusion
[ ] fracture
[ ] dislocation
[ ] multiple injury
[ ] other (please specify)_____

14. Did you injury/injuries affect please tick more than 1 box where necessary

[ ] feet & ankles
[ ] legs and thighs
[ ] lower back
[ ] upper back
[ ] shoulder
[ ] elbow
[ ] hands & arms

15. Have you been injured more than once at work [ ] Yes [ ] No

16. Has your injury/ injuries required you to claim workers' compensation over the last 10 yrs

[ ] Yes [ ] No

17 If yes please state the nature of the injury/ injuries below.

_____

_____

_____

_____

_____

_____

_____

_____

(Should more room be required please use the back of this sheet)

18. As a result of this injury/ injuries have you required Tick box if answer is YES

[ ] Time off work
[ ] Physiotherapy
[ ] Surgery
[ ] Change of lifestyle when not at work
[ ] Change of work practice
[ ] Other (please specify)_____

19. Have you ever continued working while still injured

[ ] Yes [ ] No

If Yes Why

[ ] injury not severe enough to require time off work
[ ] believed that the injury would fix itself
[ ] too busy to stop working
[ ] other (please specify)

_____
_____
_____
_____
_____

20. Have you ever used sick leave instead of Workers' Compensation Leave?

[ ] Yes [ ] No

21. Have you ever experienced musculoskeletal pain during work without it resulting in an injury.

[ ] Yes [ ] No

22. Are there any preventative measures that you have tried in an effort to reduce, minimise, or reduce injury

[ ] Yes [ ] No

23. If yes please list them below

_____
_____
_____
_____
_____
_____

24. Which if any, did you find successful

_____
_____
_____
_____
_____
_____

25. Please list any aspects of your job that you consider to be unsafe/ physically difficult

_____
_____
_____
_____
_____
_____

26. Do you know exactly how Workers' Compensation works?

[ ] Yes [ ] No

27. Would you be prepared to trial some exercises (in school time) that may be successful in reducing the number of injuries at your workplace

[ ] Yes [ ] No

If No Why not

_____
_____
_____
_____

THANK YOU FOR YOUR TIME AND EFFORT

PLEASE RETURN THIS TO THE OFFICE

Checklist **PLEASE TICK EACH DAY IF ANY OF THE FOLLOWING OCCUR** [ ]

AREA	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri
Neck																				
Pain																				
Stiffness																				
Pain when lifting																				
Pain radiating to shoulder																				
LEFT Shoulder																				
Pain																				
Pain when lifting																				
Stiffness																				
RIGHT Shoulder																				
Pain																				
Pain when lifting																				
Stiffness																				
LEFT Elbow																				
Pain																				
Pain when lifting																				
RIGHT Elbow																				
Pain																				
Pain when lifting																				
LEFT Wrist																				
Pain																				
Pain when lifting																				
RIGHT Wrist																				
Pain																				
Pain when lifting																				
NUMBNESS of the																				
Left hand including fingers																				
Right hand including fingers																				
BACK																				
Lower																				
Upper																				
Pain																				
Pain When Lifting																				
Stiffness																				

COMMENTS

As it is now the beginning of Week 6 it is time for you to:-

1. Hand in your 4 week checksheet (please place it in the envelope in office)
2. Pick up your stretching exercises sheets.
3. Stretch/prepare your muscles prior to any/all lifting. They are easy and take little time.

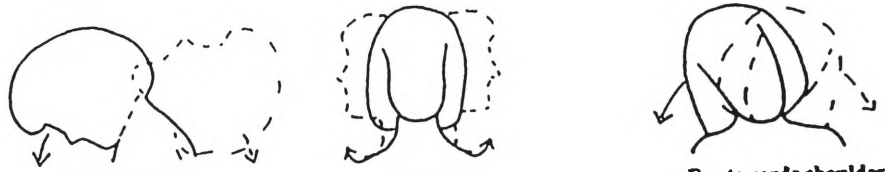
REMEMBER

- **An ounce of prevention is worth a pound of cure.**
- **The muscles you prepare just may prevent their injury and your pain.**
- **No-one else can do this for you.**

A copy of some strengthening exercises is in the office. Should you wish to use it please make a photocopy.

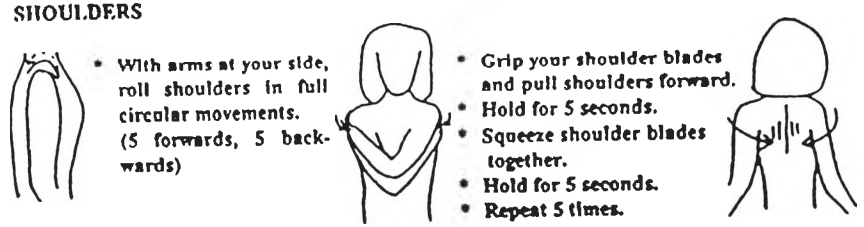
STRETCHES AND WARM-UP EXERCISES

NECK



Perform movements slowly and smoothly. Repeat each 3 times.

SHOULDERS



- With arms at your side, roll shoulders in full circular movements. (5 forwards, 5 backwards)
- Grip your shoulder blades and pull shoulders forward.
- Hold for 5 seconds.
- Squeeze shoulder blades together.
- Hold for 5 seconds.
- Repeat 5 times.

ARMS

- Stand with elbows by your side and flexed to 90 deg.
- Make your hands into fists.
- Quickly pummel forearms up and down as if beating a drum (as fast as possible for 15 seconds).

TRUNK

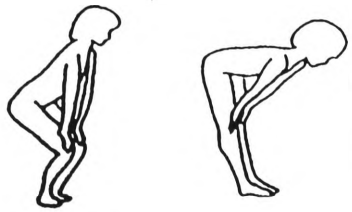
Abdominal Isometrics

- With elbows straight, place hands on front of thighs.
- Keeping arms straight, try to bend forward but resist by using your arms.
- Hold 3 seconds.
- Repeat three times.

Back Isometrics

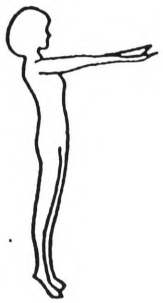
- Place hands on back of thighs below buttocks.
- Try to lean backwards but resist using your arms.
- Hold 3 seconds.
- Repeat three times.

LEGS
Hamstrings and Quadriceps



- Keep back straight, bend hips and knees, and rest hands just above knees.
- Taking the weight of your trunk onto your hands, slowly straighten knees as far as is comfortable (don't bounce).
- Slowly bend and straighten knees six times.

CALVES



- Stand on tiptoe with arms extended. (10 times)

SHINS

- Pull feet and toes towards shins, taking weight on heel. (10 times)

DEEP BREATHING

- Raise arms straight above your head whilst deeply inhaling.
- Release breath hard as you quickly bring your arms down, feeling abdominal muscles working.

LUMBAR RELEASE

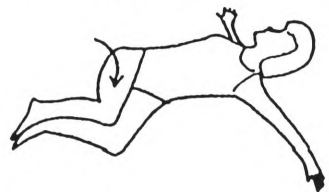
- With hands on low back, press in and lean back. Hold 5 seconds.
  (This can help relieve the back after a task involving prolonged stooping.)

After strengthening exercises have been performed, a few stretches should be undertaken to maintain flexibility. Repeat each stretch 3 times. Remember the rule of thumb.

HAMSTRING STRETCHES - stretch hamstrings alternately.

- Keeping knee straight, pull leg towards you until you feel a stretch down back of thigh.
- Ensure other knee is bent.
- Hold 10 seconds.

- Bend forward from, hips keeping back straight.
- Tilt head forward slightly.
- Pull toes toward you, keep knee straight.
- Hold 10 seconds.



ROTATION
- Lie on back with arms out to side.
- Bend knees up.
- Keeping knees together, slowly and gently roll them to the floor on one side (keeping shoulders still).
- Roll knees to other side.

SIDE STRETCH
- Bend up one knee, grasp with opposite hand.
- Pull knee gently towards floor whilst looking in the opposite direction.
- Hold for 10-20 seconds, and feel the stretch in your buttocks and back.

HIP STRETCH
- Clasp knee to chest, hold 10 seconds.
- Ensure other knee is bent.

ARCHING
- Kneel on all fours
- Arch your back, hold for 10 seconds and return to neutral position.

Adapted from Straight Forward About Backs 1987, Dept of Arts, Sport, the Environment, Tourism and Territories.

APPENDIX I

COMPLETION IS VOLUNTARY & ANONYMOUS

[ ]
PLEASE INSERT YOUR
ALLOCATED NUMBER HERE

FINAL QUESTIONNAIRE

Please tick the appropriate box thus [√]
Information for statistical analysis purposes only.

Questions 1-18 are directly from Worksafe Australia and are aimed at assessing whether there is any risk involved in manual handling at a workplace.

1. Is there frequent or prolonged bending down where your hands pass below mid thigh height? [ ] Yes [ ] No

2. Is there frequent or prolonged reaching above your shoulder? [ ] Yes [ ] No

3. Is there frequent or prolonged bending due to an extended reach forward? [ ] Yes [ ] No

4. Is there frequent or prolonged twisting of your back? [ ] Yes [ ] No

5. Are awkward postures assumed frequently or over prolonged periods, that is, postures that are not forward facing and upright? [ ] Yes [ ] No

6. Is manual handling performed frequently or for long time periods by you? [ ] Yes [ ] No

7. Are loads moved or carried over long distance? [ ] Yes [ ] No

8. Is the weight of the object:

   (a) more than 4.5 kg and handled from a seated position? [ ] Yes [ ] No

   (b) More than 16 kg and handled in a working posture other than seated? [ ] Yes [ ] No

   (c) More than 55kg? [ ] Yes [ ] No

9. For pushing, pulling or other application of forces, are large pushing/pulling forces involved? [ ] Yes [ ] No

10. Is the load difficult or awkward to handle, for example, due to its size, shape, temperature, instability or unpredictability? [ ] Yes [ ] No

11. Is is difficult or unsafe to get adequate grip of the load? [ ] Yes [ ] No

12. Is the task performed in a confined space? [ ] Yes [ ] No

13. Is the lighting inadequate for safe manual handling? [ ] Yes [ ] No

14. Is the work environment particularly cold or hot? [ ] Yes [ ] No

15. Are the floor working surfaces cluttered, uneven, slippery or otherwise unsafe? [ ] Yes [ ] No

16. Are you new to the work or returning from an extended period away from work? [ ] Yes [ ] No

17. Are there age-related factors, disabilities or other special factors that may affect task performance? [ ] Yes [ ] No

18. Does your clothing interfere with manual handling performance? [ ] Yes [ ] No

---

19. Did you participate in the daily morning exercise classes?

[ ] Always [ ] 3 or more times per week [ ] 1-3 times per week

[ ] Rarely [ ] Never [ ] What exercise class?

20. Did you prepare your muscles by stretching prior to lifting ?

[ ] Always [ ] Most of the time [ ] At least once a day

[ ] Rarely [ ] Never [ ] Why stretch?

21. Do you believe these measures were effective?

<u>Exercising</u>

[ ] did help [ ] probably helped [ ] too busy [ ] waste of my time (and others')

<u>Stretching</u>

[ ] did help [ ] probably helped [ ] too busy [ ] waste of my time (and others')

Select any 2 days (Monday - Friday), one should be your heaviest lifting day while the other should be your lightest day. Teachers please indicate should you select your RFF day for this exercise.

For the WHOLE of those days please indicate the number of times you 'manually handle' someone/something. Many of these manual handling activities will involve more than one action. Please include all work activities including playground duty, morning/afternoon loading and unloading of buses, and excursions.

HERE IS A SAMPLE

Lightest day: Monday RFF Day [ ] Yes [ ] No (Teachers only)

Activity	Heavy	Light	Awkward
Lifting/ Lowering	IIII	IIIIIIIII	III
Pushing/Pulling	I	I	I
Carrying/Moving	IIII	III	I
Holding/ Restraining	I	II	

One stroke for each time you manual handle

Heavy includes
students (most), equipment, schoolbags (most), nappy bags, Nursing Home's boxes and lunch baskets,

Light includes
a few nappies, potty chair, clipboard and pens, paperwork, individual lunches, students' drinks

Awkward includes
twisting, stretching, students, positioning equipment

Heaviest day: Wednesday

Activity	Heavy	Light	Awkward
Lifting/Lowering	IIIIIIIIIIII	IIIIIIIIIIII	IIIIIII
Pushing/Pulling	IIIIIII	IIIIIII	IIII
Carrying/Moving	IIIIIII	IIII	IIII
Holding/Restraining	IIII	IIII	IIII

Should you be in doubt as to whether anything is heavy, light, or awkward, ask someone for a second opinion, or phone me at home on 611683.

PLEASE INDICATE IN THE BOXES PROVIDED. ONE STROKE FOR EACH AND EVERY TIME YOU MANUALLY HANDLE SOMETHING OR SOMEONE.

LIGHTEST DAY: _____ RFF Day [ ] Yes [ ] No
(Teachers only)

Activity	Heavy	Light	Awkward
Lifting / Lowering			
Pushing/Pulling			
Carrying/Moving			
Holding/ Restraining			

HEAVIEST DAY: _____

Activity	Heavy	Light	Awkward
Lifting/Lowering			
Pushing/Pulling			
Carrying/Moving			
Holding/Restraining			

THANK YOU FOR YOUR TIME AND EFFORT

PLEASE RETURN THIS TO THE OFFICE

Activity Toileting and positioning a student

Student profile : Male, non-ambulatory, 12 years of age, has a severe intellectual disability, is also severely physically disabled, prone to muscular spasms, weight unknown but approx 20-25 kgs. Two staff members will attend to the student's toileting needs.

1. Lifting the student from his wheelchair requires :
- Bending (lowering) to release brake on wheelchair
- Staff moving the wheelchair into position near the hydraulic lift tables
- Staff bending (lowering) to undo posture straps.
- Staff lifting (in unison) student out of wheelchair and lowering him onto the change table.
- Moving wheelchair away from the change table

2. Changing the nappy requires:
- One staff member holds student into position while another staff member lifts the student's feet, so that they may remove student's lower clothing.
- One staff member holds student into position while another staff member lifts the student's feet, so that they may remove a wet nappy.
- While the staff member lowers the nappy into the nappy receptacle, the other staff member continues to hold student in position, also holding the student's feet.
- The student's hip are lifted and held while a nappy is slid into position.
- Each article of clothing the student had removed now needs to be replaced (lifting) , with the hips and legs of the student being elevated (lifting) each time. The other staff member continues to hold the student.

3. Placing student into standing frame requires:
- Pushing standing frame closer to change table
- Bending (lowering) to position all posture straps appropriately
- Lifting and holding the students legs (one at a time) to secure leg wraps (for limb support in lieu of muscles).
- Lifting student into standing frame.
- Holding student (one staff member) while securing (lowering) him with posture straps (second staff member)
- Pushing standing frame way from change table into appropriate place
- Lift and lower sandbags to secure equipment.

The activity takes up to fifteen minutes. Total actions by each staff member

Activity	Heavy		Light		Awkward	
	S 1	S 2	S 1	S 2	S 1	S 2
Lifting/ Lowering	10	3	3	1	5	2
Pushing/Pulling	0	1	0	1	0	1
Carrying/Moving	0	0	2	0	0	0
Holding/ Restraining	0	5	0	2	0	3
TOTALS	10	8	5	4	5	6

KEY
S1 is the first staff member
S2 is second staff member

This is for one activity that must now be repeated for the rest of the class.

APPENDIX J

Personnel Manager
Orange Vale Pty Ltd
P.O. Box 781
Darwin
N.T.

12/9/1995

Dear Sir/ Madam,

My name is Sue Goor and I am currently completing an Hons Master's in Total Quality Management through Wollongong University. This year I am writing a thesis and have chosen as my area Continuous Improvement within Safety Management.

It is my understanding that Orange Vale has targeted safety as a priority area as part of its TQM implementation.

One of my areas of interest within the organisation that I am researching is how it disseminates its OH&S statistics (Workers' Compensation), to who and when. By this I mean the injury and disease incidence of Orange Vale employees only.

So that I may develop an accurate picture of organisational practice generally I am writing to 20 large organisations to find out how they promulgate their OH&S information.

Could you please indicate your organisation's policy and/or practice on releasing OH&S statistics so that I may compare TQM organisational practice with non TQM organisational practice as part of safety management. I have included some statements relating to safety which you may wish to use. Please use the envelope provided to return your response.

Thank you for your time and effort in reading and responding to this request.

Sincerely yours,

Sue Goor
2 Western Ave
DAPTO NSW 2530

Sue Goor
2 Western Ave
DAPTO NSW 2530

Please circle any/all applicable responses

In regard to OH&S information

Orange Vale's policy is such that

[A] This information is not even distributed to Departmental Heads.
[B] Under no circumstances would this information be released beyond Departmental Heads who know that this information is sensitive and not for further dissemination.
[C] This information is discussed by Departmental Heads with other managers but never with the complete set of figures - just trends.
[D] This information is discussed by Departmental Heads with other employees but never with the complete set of figures - just trends.
[E] This information is available for research purposes to employees of the company.
[F] This information is available to all interested parties.
[G] This information is regularly communicated to other organisations.
[H] This information is nobody's business.
[I] Nobody has ever requested O.H.&S information.
[J] Our policy is to not reveal our policy.
[K] Our policy depends upon who requested the information.
[L] Our policy is not yet formulated in this area.
[M] Who says we need a policy?
[N] This information is regularly communicated to employees.
[O] This information is communicated to employees on an irregular basis.

Background Information

OH&S information is statistically analysed for the whole corporation.	[Yes]	[No]
OH&S information is statistically analysed for each separate worksite.	[Yes]	[No]
Your Organisation is currently using TQM strategies.	[Yes]	[No]

Comments:_____

_____

_____

_____

_____

TQM	CORPORATION NAME*	INFORMATION COMMUNICATED TO							INFORMATION COLLATED	
		Departmental Heads	All Employees				Available for research to employees		Analysed	
		Manager Only	Figures	Trends	Regularly	Irregularly		others	overall	each worksite
NO	Hospitality Chain									
YES	ALCAN (CAPRAL)		YES		YES		YES	YES	YES	YES
YES	Australia Post		YES		YES		YES	†	YES	YES
YES	B.H.P.		YES		YES		YES	YES	YES	YES
NO	Coles Myer Corporation			YES	YES	YES	YES		YES	
YES	DUPONT (Australia) Ltd		YES		YES		YES	†	YES	YES
YES	Ford Motor Co of Australia Ltd		YES		YES		YES		YES	YES
NO	Large Insurance Company									
NO	Hilton Australia	YES							NO	NO
YES	Illawarra Area Health Service	YES					†	†	YES	YES
YES	Large Insurance Company									
NO	QANTAS			YES			YES		YES	YES
YES	Roads & Traffic Authority	YES					NO		YES	NO
NO	Shellharbour Council		YES		YES		YES	YES	YES	YES
NO	Transport Industry - Govt									
YES	Sydney Electricity		YES		YES		YES	YES	YES	YES
YES	Sydney Water		YES		YES		YES	YES	YES	YES
YES	TELSTRA			YES	YES		YES**	YES**	YES	YES
YES	Wollongong City Council		YES	YES			YES**		YES	YES
NO	Higher Education Facility									

* Organisations which did not respond are not identified by name ** Trends Only † CEO approval required

Strategic Approach

The school conducts its risk assessment in manual handling. Together with the information from questionnaires and interviews the committee develops an ongoing course of action that may include such aspects:

- Ergonomic re-design
- Work practice re-design
- Training and development in team lifting, risk assessment and monitoring techniques

It will be necessary to prioritise the school's needs and also determine what the school can achieve and what support is required from the DSE. This information needs to be officially communicated to the Department (via Regional Office/ Wollongong District Office) from the school's formal O.H.&S. committee as an official needs assessment. The DSE cannot help if they are not formally aware that it is required.

A time frame needs to be developed by the school as to when actions need to be implemented by. Should no satisfactory results occur by this time line end, then corrective action needs to be taken. Hence it is a cyclic process. Even if all issues are addressed and manual handling is no longer causing injuries it needs to be regularly monitored.

In light of the DSE training package Risk Management is obviously the DSE preferred course of action . This cannot occur at Wattle St SSP without some form of assistance from the DSE as the school is atypical in that :

1. It has 78 students classified as having severe intellectual disabilities many of whom also have severe physical disabilities. This is sufficient to create a school with 13 classes.

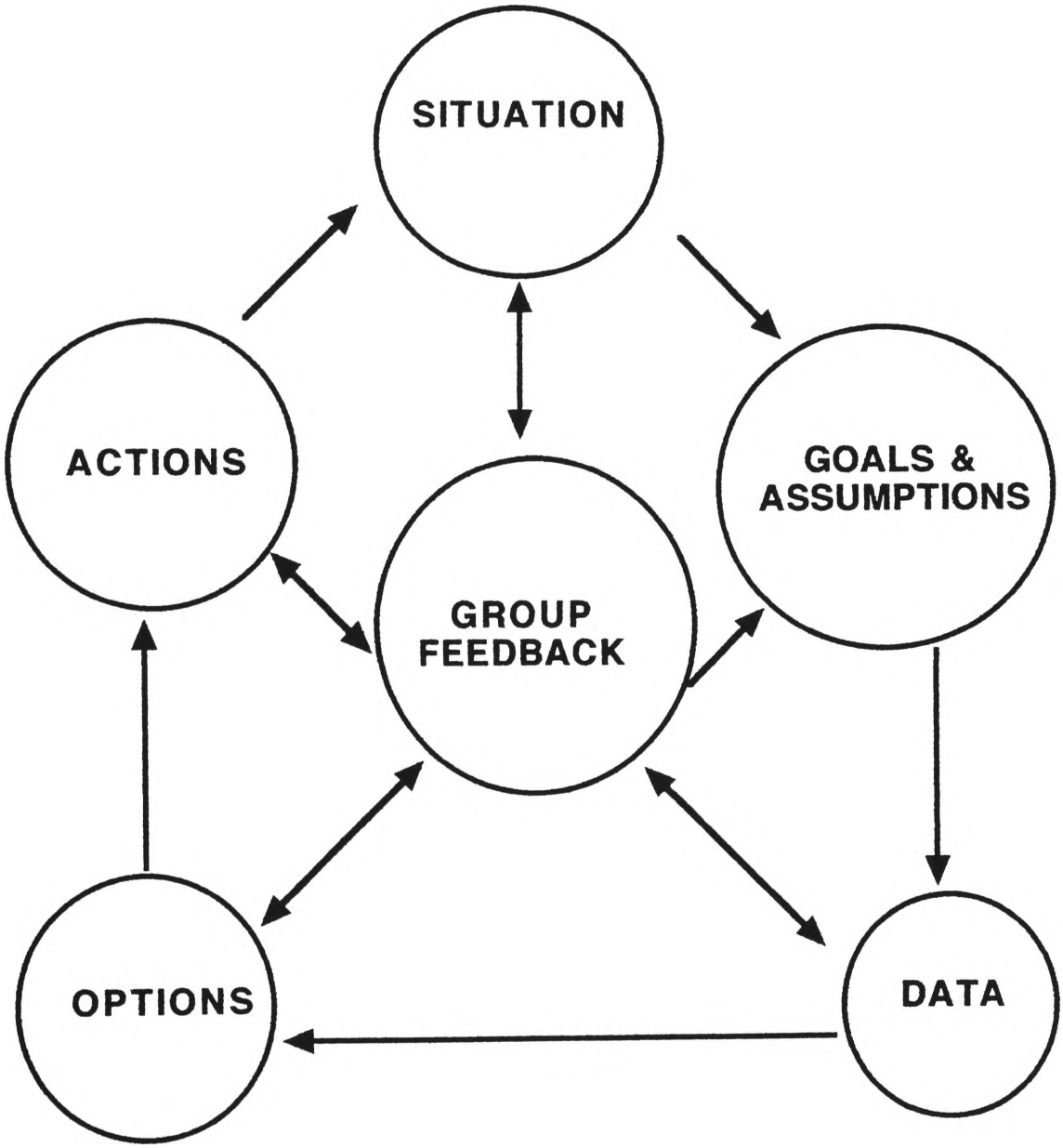
2. There are two residential facilities that are situated within the school's feeder area.

3. There is little scope for staff - particularly T. A.'s (Special) to move to another school within the Region.

As a final course of action it is possible to invite a Workcover inspector into the school who will follow a legal course of action which the DSE will find binding.

At the school level it is possible to use the Risk Assessment Flowchart to develop a risk management approach to the issue of manual handling injuries. The tools that were used are all available through ClarisWorks which is readily available at the school.

ACTION RESEARCH - ESSENTIAL COMPONENTS



Source : Bennett & Oliver "How To Get The Best From Action Research" 1988:9

TOOLS THAT CAN BE USED

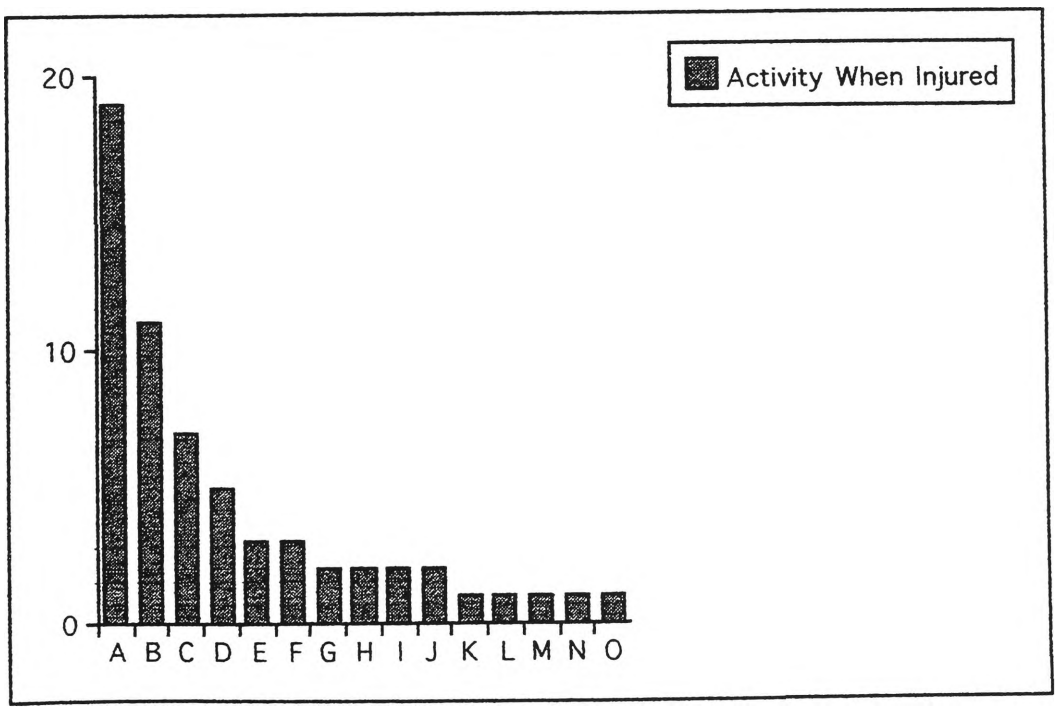
TOOL ONE

Histogram showing frequency arranged in decreasing order (pareto diagram)

ACTIVITY WHEN INJURY OCCURRED

	A	B
1		Activity When
2	A	19
3	B	11
4	C	7
5	D	5
6	E	3
7	F	3
8	G	2
9	H	2
10	I	2
11	J	2
12	K	1
13	L	1
14	M	1
15	N	1
16	O	1

A Lifting
B Twisting
C Child Dropped
D Unloading buses
E Restraining students
F Wheelchairs pushed into you
G Interacting with students
H Positioning
I Putting away/ lifting equipment
J Slipping on floor
K Camp activities
L Crammed space
M Kicked by student
N Playground duty
O Pushing wheelchair



TOOL TWO Cause and Effect Diagram See Appendix T

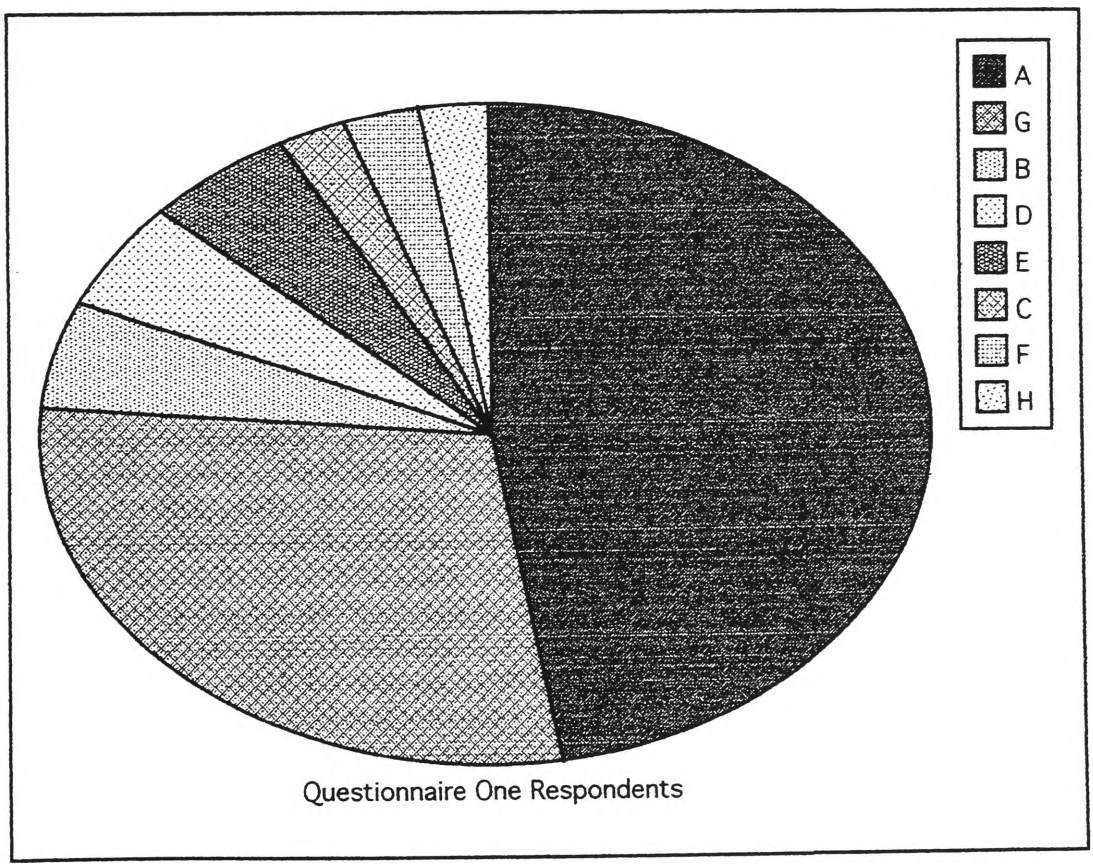
TOOL THREE Checksheet See Appendix G

TOOL FOUR PIE CHART

TABLE 4.1.1.1 Response Rate Questionnaire One

Category	Number	Classification
A	18	Classroom teacher/ teacher librarian
G	11	Teacher's Assistant
B	2	Cleaner
D	2	Executive (Teaching)
E	2	Executive (Non-Teaching)
C	1	Clerical/office
F	1	General Assistant
H	1	Other - Support Services

	A	B
1		Questionnaire O
2	A	18
3	G	11
4	B	2
5	D	2
6	E	2
7	C	1
8	F	1
9	H	1

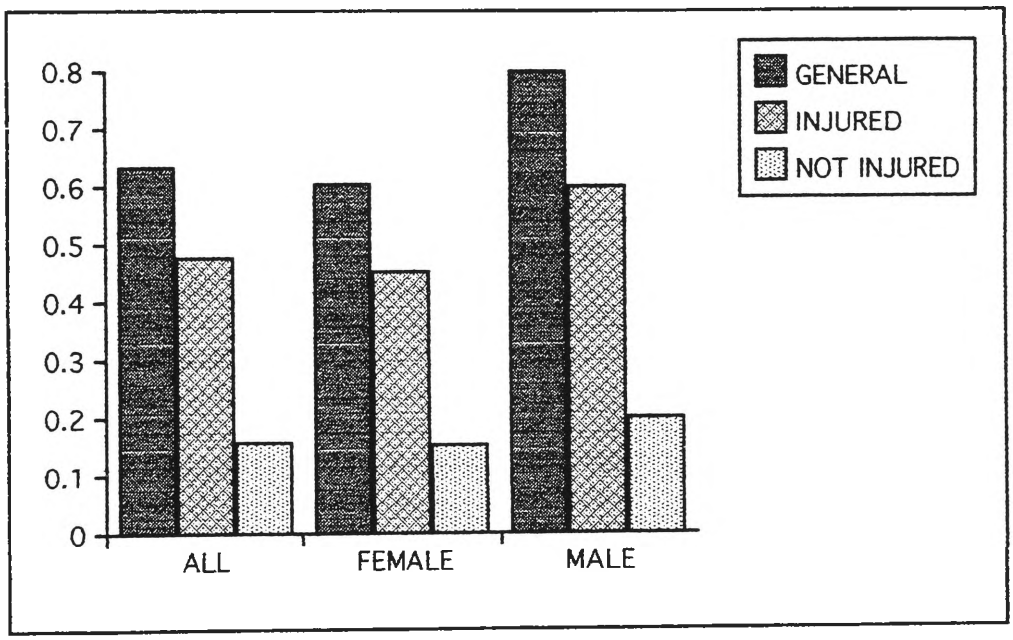


TOOL FIVE - BAR GRAPHS

Continuous Service

	General	Injured	Not Injured
ALL	63.2%	47.4%	15.8%
FEMALE	60.6%	45.45%	15.15%
MALE	80%	60%	20%

	A	B	C	D
1		GENERAL	INJURED	NOT INJURED
2	ALL	0.632	0.474	0.158
3	FEMALE	0.606	0.4545	0.1515
4	MALE	0.8	0.6	0.2



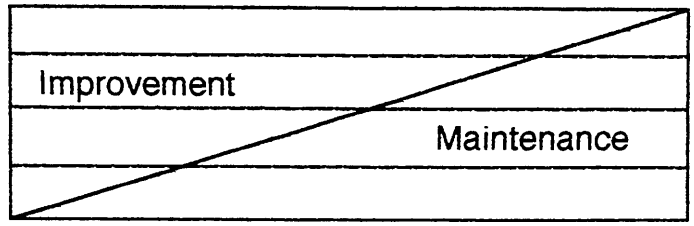
TOOL SIX RELATIONS DIAGRAMS

SEE Appendix U

KAIZEN

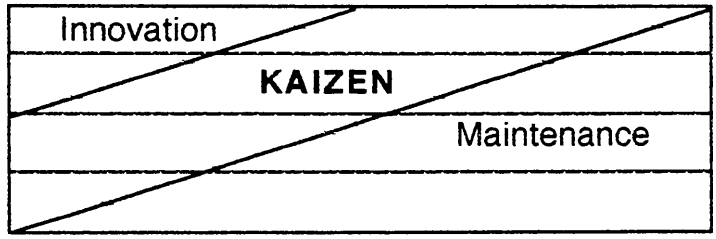
Continuous Improvement +

Top Management
Middle Management
Supervisors
Workers



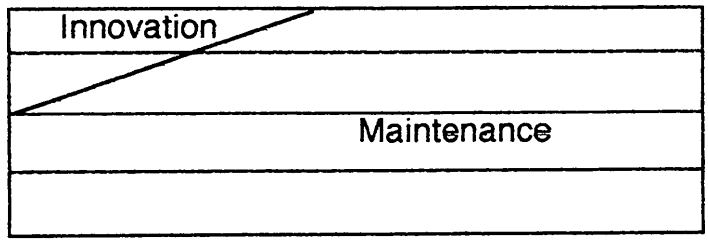
Traditional Model

Top Management
Middle Management
Supervisors
Workers



TQM Model

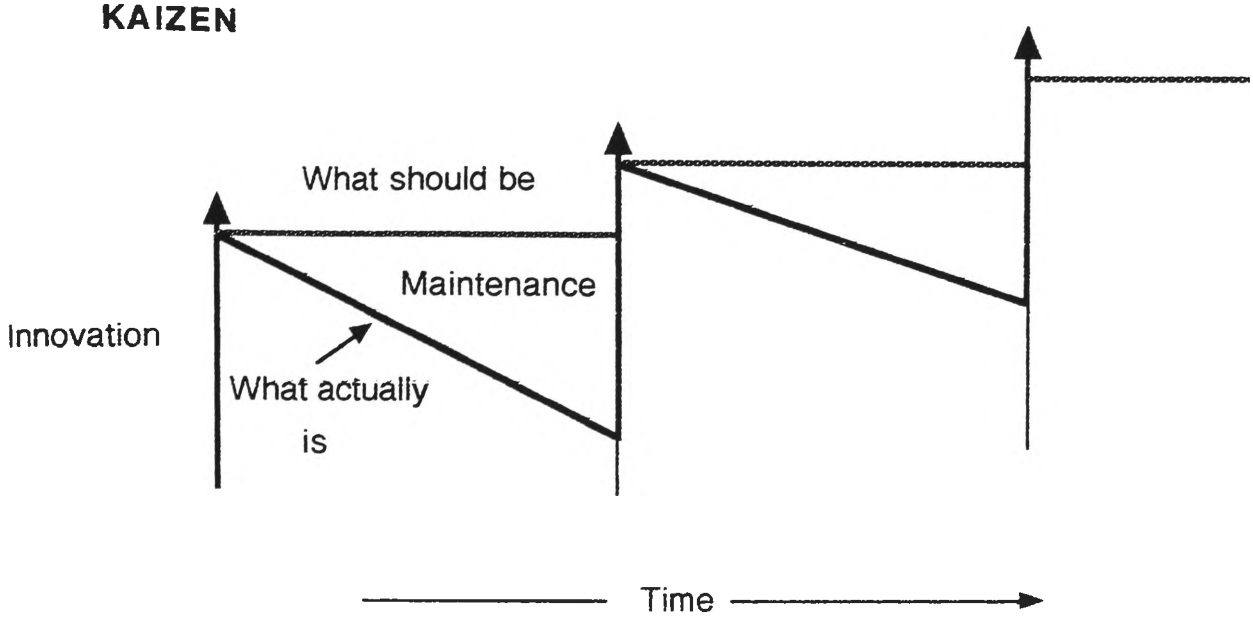
Top Management
Middle Management
Supervisors
Workers

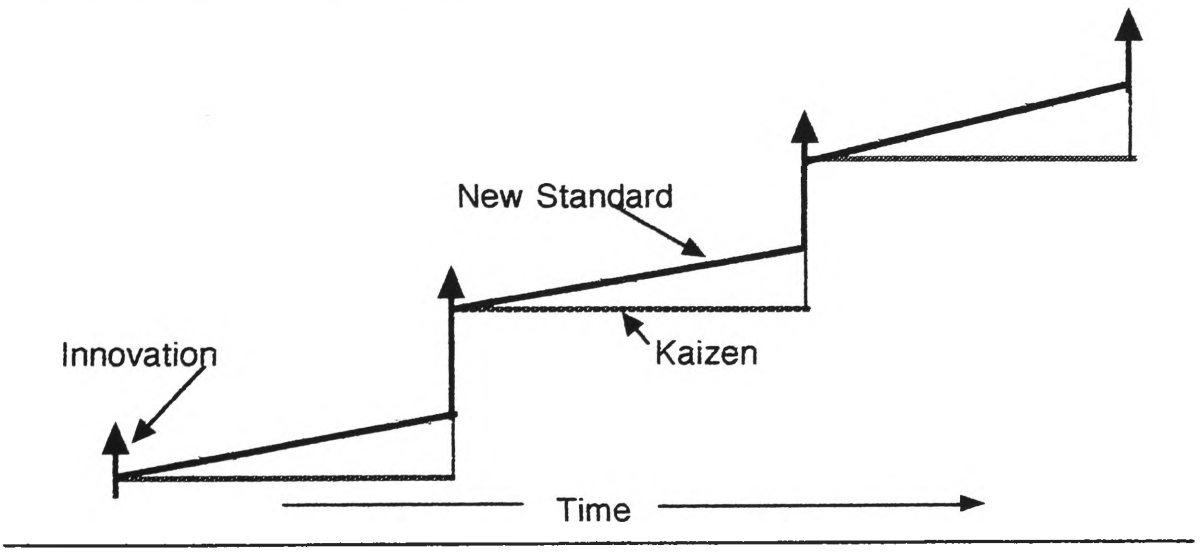


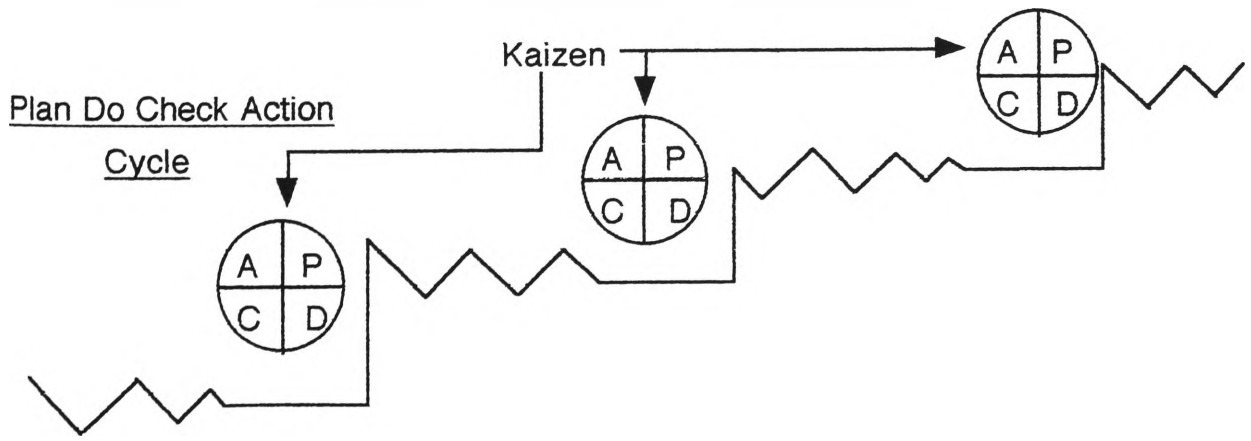
Western Model

Source : Imai M (1986) "KAIZEN" The Key to Japan's Competitive Success", p5,7

KAIZEN

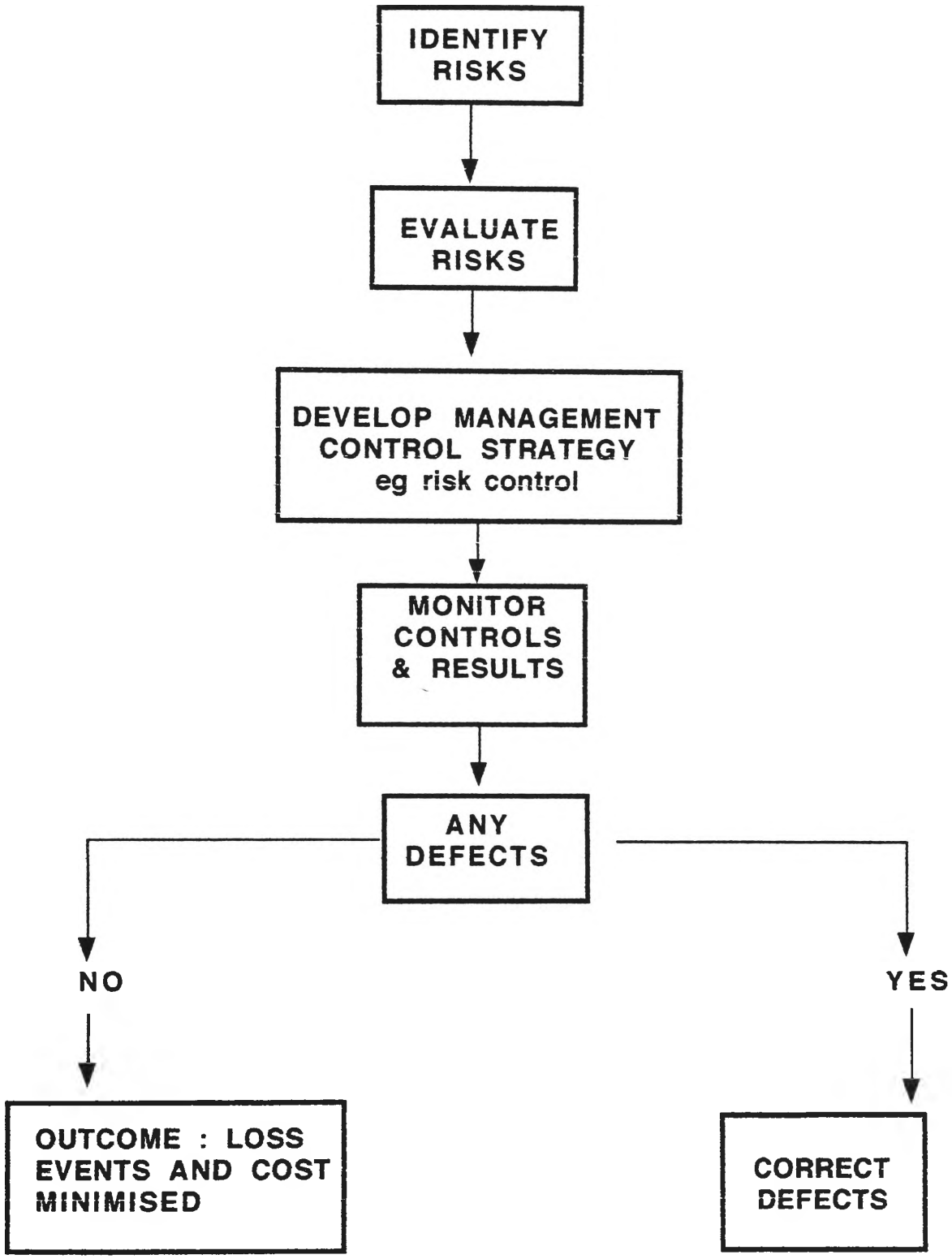






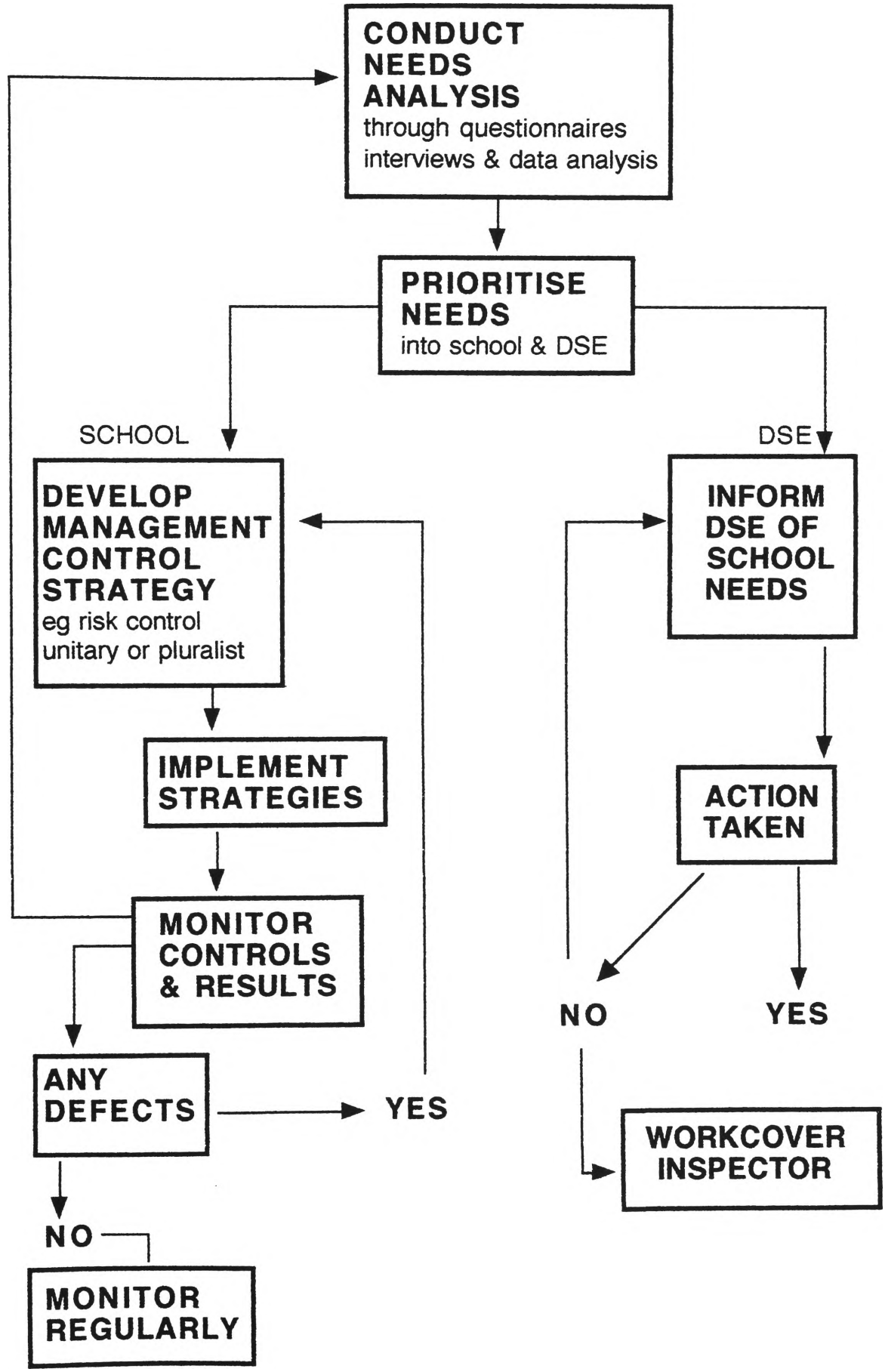
Source : Imai M (1986) "KAIZEN" The Key to Japan's Competitive Success", p26-27,64.

RISK MANAGEMENT PROCESS



Source : DSE Risk Management Package 1993

WATTLE ST SSP RISK MANAGEMENT PROCESS



INTERVIEW QUESTIONS

STAFF QUESTIONS MANUAL HANDLING

1. How much manual handling is happening at the school?

2. Has this changed over the years? If so - how?

3. What do you consider as the issues with manual handling?

4. What is the impact of manual handling injuries at the school?

5. What could be done to help?
   - by the school
   - by the staff
   - by the DSE
   - by others

6.. Any comments?

Previously Injured [ ] Yes [ ] No

RESPONSES

APPENDIX P

ALL RESPONDENTS

1. **GENDER**

[5] M [33] F

2. **AGE**

[5] 30-34 [7] 35-39 [5] 40-44 [7] 45-49 [10] 50-54 [4] 55+

3. **LENGTH OF SERVICE**

[1] 0-4	[12] 5-9	[11] 10-14	[6] 15-19
[2] 20-24	[2] 25-29	[3] 30-34	

4. **CONTINUOUS EMPLOYMENT**

[24] YES [14] NO

5. **REASON FOR NO**

[10]	Maternity / Child Rearing	[2]	Other employment
[2]	Travel	[1]	Casual
[1]	Moved overseas	[1]	Teacher exchange

6. **CURRENT LENGTH OF SERVICE AT THIS SCHOOL (YRS)**

0.34 ——→ 28

7. **IN SCHOOL CLASSIFICATION**

[18]	Classroom teacher/ teacher librarian	[2]	Cleaner
[1]	Clerical/office	[2]	Executive (Teaching)
[2]	Executive (Non-Teaching)	[1]	General Assistant
[11]	Teacher's Assistant	[1]	Other - Support Services

8. **POSITION**

[33] Permanent [5] Casual

9. **WORK**

[31] Full time [7] Part time

10. **PART- TIME AVERAGE** (weekly hours)

12 ——→ 26

11. **INJURED AT WORK**

[26] YES [12] NO

12. ACTIVITY WHEN INJURED

[19] Lifting
[7] Child Dropped
[3] Restraining students
[2] Interacting with students
[2] Putting away/ lifting equipment
[1] Camp activities
[1] Kicked by student
[1] Pushing wheelchair
[11] Twisting
[5] Unloading buses
[3] Wheelchairs pushed into you
[2] Positioning
[2] Slipping on floor
[1] Crammed space
[1] Playground duty

13. INJURY TYPE

[21] Sprain/strain
[4] Laceration
[2] Fracture
[6] Contusion
[2] Dislocation

14. INJURIES AFFECTED

[13] Lower Back
[10] Shoulder
[6] Upper back
[3] Feet & ankles
[1] Chest
[10] Hands & arms
[8] Legs and thighs
[3] Elbow
[2] Neck
[1] Lower back

15. INJURED MORE THAN ONCE

[19] Yes [7] No

16. CLAIMED W.C.

[19] Yes [7] No

17. FOR WHAT INJURIES.

[13] Backstrain
[5] Neck injury/strain
[1] Badly sprained & dislocated knee
[1] Bruising on shin
[1] Contusions to face/ neck arms
[1] Hand injury
[1] Laceration to the mouth
[1] Sciatica -back down to right leg
[1] Wrist injury - long term weakness
[6] Shoulder
[2] Elbow injury
[1] Broken finger
[1] Cervical disc dislocation
[1] Dislocated finger
[1] Heel laceration
[1] Spinal disc problems
[1] Soft tissue injury
[1] Twisted ankle

18. INJURY RESULTED IN

[21] Time off work
[19] Physiotherapy
[10] Change of lifestyle when not at work
[2] Change of work practice
[2] Surgery
[1] Hydrotherapy & exercise therapy

19. **CONTINUED TO WORK THOUGH INJURED**

[23] Yes [4] No (1 responded Yes & No)

If Yes Why

[19]	Injury not severe enough to	[11]	Believed injury would fix itself
[3]	Too busy to stop working	[1]	Casual
[1]	Had to finish the day	[1]	Tiredness...later on an injury

20. **SICK LEAVE INSTEAD OF W.C.**

[16] Yes [10] No

21. **MUSCULOSKELETAL PAIN WITHOUT INJURY**

[22] Yes [3] No (1 no response)

22. **ANY PREVENTATIVE MEASURES USED**

[32] Yes [6] No

23. **LIST THEM IF YES**

[23]	Exercise fitness activities	[16]	Careful / correct lifting
[7]	Two person lift	[5]	Yoga
[5]	Warm up exercises	[4]	Lifting workshops
[4]	Secure equipment	[2]	Minimising lifting
[1]	Aware of student abilities	[1]	Hydrotherapy
[1]	Hot showers prior to work	[1]	Levers to assist in lifting
[1]	Listen to the advice of colleagues	[1]	Taking time
[1]	Platform to lesson lifting height	[1]	Weight reduction
[1]	Release falling students	[1]	Relaxation classes
[1]	Ensure assistance available if needed	[1]	Use of correct equipment

24. **WHAT WAS SUCCESSFUL**

[20]	Regular exercise / fitness activities	[15]	Careful / correct lifting technique
[3]	Lifting workshops	[4]	Two person lift
[3]	Warm -up activities	[2]	Ergonomic/ mechanical aids
[2]	Securing equipment	[1]	Hot showers prior to work
[1]	Hydrotherapy	[1]	Listen to the advice of colleagues
[1]	Minimising lifting	[1]	Regular stretching exercises
[1]	Release dropping student		

25. **LIST UNSAFE DIFFICULT TASKS**

[12]	Positioning students (incl toileting)	[12]	Lifting students (part. heavy ones)
[9]	Supporting st. (gait / fits/ dressing)	[4]	Managing ED students in beh mod programs
[3]	Unexpected obstacles in pathways	[2]	Very heavy students

[2] Removing student to time - out
[1] Assisting students in/out of spa
[1] Effects of photocopier. PVC's in fluro lights
[1] Lifting sandbags
[1] Opening windows in room
[1] Playground duty in large playground
[1] Showering students
[1] Time management/ demanding class
[1] Twisting & Turning
[1] Moving equipment over various surface areas in a small area
[3] None
[2] Restricted space
[1] Carrying equipment up stairs
[1] Insufficient training in lifting technique
[1] Opening / closing hall side doors
[1] Physical incompatibility with lifting partner
[1] Pushing/pulling chairs with bases
[1] Supporting st in equipment (walker)
[1] Too much bending
[1] Unloading buses

26. KNOW HOW W.C. WORKS

[13] Yes [25] No

27. PREPARED TO TRIAL SOME EXERCISES

[36] Yes [2] No

If No Why not

[1] No time allowed by contract company.
[1] Class does not require lifting.

INJURED	NOT INJURED
1. SEX	**1. SEX**
[3] M [23] F	[2] M [10] F
2. AGE	**2. AGE**
[2] 30-34 [3] 35-39 [4] 40-44 [4] 45-49 [9] 50-54 [4] 55 +	[3] 30-34 [4] 35-39 [1] 40-44 [3] 45-49 [1] 50-54
3. LENGTH OF SERVICE	**3. LENGTH OF SERVICE**
[7] 5-9 [7] 10-14 [6] 15-19 [1] 20 -24 [2] 25-29 [3] 30- 34	[1] 0-4 [5] 5-9 [4] 10-14 [1] 20 -24 [1] 25-29
4. CONTINUOUS EMPLOYMENT	**4. CONTINUOUS EMPLOYMENT**
[18] YES [8] NO	[6] YES [6] NO
5. REASON FOR NO	**5. REASON FOR NO**
[7] Maternity / Child Rearing [1] Casual [1] Travel [1] Other employment	[1] Other Employment [1] Travel [3] Maternity/ Child Rearing [1] Moved overseas [1] Teacher exchange
6. CURRENT LENGTH OF SERVICE AT THIS SCHOOL (YRS)	**6. CURRENT LENGTH OF SERVICE AT THIS SCHOOL (YRS)**
0.34 → 28	0 → 11
7. IN SCHOOL CLASSIFICATION	**7. IN SCHOOL CLASSIFICATION**
[10] Classroom teacher (including teacher librarian) [1] Cleaner [1] Clerical/office [1] Executive (Teaching) [2] Executive (Non-Teaching) [1] General Assistant [10] Teacher's Assistant	[8] Classroom teacher (including teacher librarian) [1] Cleaner [0] Clerical/office [1] Executive (Teaching) [0] Executive (Non-Teaching) [0] General Assistant [1] Teacher's Assistant [1] Other - Support Services
8. POSITION	**8. POSITION**
[24] Permanent [2] Casual	[9] Permanent [3] Casual
9. WORK	**9. WORK**
[24] Full time [2] Part time	[7] Full time [5] Part time
10. PART- TIME AVERAGE hrs per week	**10. PART- TIME AVERAGE** hrs per week
12.5 → 18.75	12 → 26

INJURED CONTINUED

11. INJURED

[26] YES

12. ACTIVITY WHEN INJURED

[19] Lifting
[11] Twisting
[7] Child Dropped
[5] Unloading buses
[3] Restraining students
[3] Wheelchairs pushed into you
[2] Interacting with students
[2] Positioning
[2] Putting away/ lifting equipment
[2] Slipping on floor
[1] Camp activities
[1] Crammed space
[1] Kicked by student
[1] Playground duty
[1] Pushing wheelchair

13. INJURY TYPE

[21] sprain/strain
[5] contusion
[4] laceration
[2] dislocation
[2] fracture
[1] Bruising

14. INJURIES AFFECTED

[13] Lower Back
[10] Hands & arms
[10] Shoulder
[8] Legs and thighs
[6] Upper back
[3] Elbow
[3] Feet & ankles
[2] Neck
[1] Lower back
[1] Chest

15. INJURED MORE THAN ONCE

[19] Yes [7] No

16. CLAIMED W.C.

[19] Yes [7] No

NOT INJURED CONTINUED

11. INJURED

[12] NO

INJURED CONTINUED

17. FOR WHAT INJURIES.

[13] Backstrain
[6] Shoulder
[5] Neck injury/strain
[2] Elbow injury
[1] Badly sprained & dislocated knee
[1] Broken finger
[1] Bruising on shin
[1] Cervical disc dislocation
[1] Contusions to face/ neck arms
[1] Dislocated finger
[1] Hand injury
[1] Heel laceration
[1] Laceration to the mouth
[1] Sciatica -back down to right leg
[1] Spinal disc problems
[1] Soft tissue injury
[1] Twisted ankle
[1] Wrist injury- long term weakness

18. INJURY RESULTED IN

[21] Time off work
[19] Physiotherapy
[10] Change of lifestyle when not at work
[2] Change of work practice
[2] Surgery
[1] Hydrotherapy & exercise therapy

19. CONTINUED TO WORK THOUGH INJURED

23] Yes [4] No
(1 responded Yes & No)
If Yes Why
[19] Injury not severe enough to require time off work
[11] Believed that the injury would fix itself
[3] Too busy to stop working
[1] Casual
[1] Had to finish the day
[1] Lower back tiredness contributed to an injury later on

20. SICK LEAVE INSTEAD OF W.C.

[16] Yes [10] No

21. MUSCULOSKELETAL PAIN WITHOUT INJURY

[22] Yes
[3] No

(1 no response)

INJURED CONTINUED

22. ANY PREVENTATIVE MEASURES USED

[24] Yes [2] No

23. LIST THEM IF YES

[19] Exercise fitness activities
[13] Careful / correct lifting
[6] Two person lift
[5] Yoga
[4] Lifting workshops
[4] Secure equipment
[3] Warm up exercises
[2] Minimising lifting
[1] Aware of student abilities
[1] Ensure assistance available if needed
[1] Hydrotherapy
[1] Levers to assist in lifting
[1] Platform to lesson lifting height
[1] Release falling students
[1] Relaxation classes
[1] Taking time
[1] Weight reduction
[1] Use of correct equipment

24. WHAT WAS SUCCESSFUL

[16] Regular exercise / fitness activities
[12] Careful / correct lifting technique
[3] Lifting workshops
[3] Two person lift
[2] Ergonomic/ mechanical aids
[2] Securing equipment
[2] Warm -up activities
[1] Hydrotherapy
[1] Release dropping student

NOT INJURED CONTINUED

22. ANY PREVENTATIVE MEASURES USED

[8] Yes [4] No

23. LIST THEM IF YES

[1] Hot showers prior to work
[3] Use correct lifting technique
[1] Lift with another person
[1] Listen to the advice of colleagues
[4] Regular Exercise / fitness activities
[1] Warming up shoulders prior to lifting
[1] Regular stretching exercises

24. WHAT WAS SUCCESSFUL

[1] Hot showers prior to work
[3] Use correct lifting technique
[1] Lift with another person
[1] Listen to the advice of colleagues
[4] Regular Exercise / fitness activities
[1] Warming up shoulders prior to lifting
[1] Regular stretching exercises

INJURED CONTINUED

25. LIST UNSAFE DIFFICULT TASKS

[11] Positioning students (incl toileting)
[10] Lifting students (part. heavy ones)
[7] Supporting st. (gait / fits/ dressing)
[4] Managing ED students in beh mod programs
[3] Unexpected obstacles in pathways
[2] Restricted space
[1] Lifting sandbags
[1] Opening / closing hall side doors
[1] Opening windows in room
[1] Pushing/pulling chairs with bases
[1] Removing student to time - out
[1] Showering students
[1] Supporting st in equipment (walker)
[1] Time management/ demanding class
[1] Too much bending
[1] Unloading buses
[3] None

26. KNOW HOW W.C. WORKS

[11] Yes [15] No

27. PREPARED TO TRIAL SOME EXERCISES

[25] Yes [1] No

If No Why not

No time allowed by contract company.

NOT INJURED CONTINUED

25. LIST UNSAFE DIFFICULT TASKS

[2] Continuous lifting
[2] Very heavy students
[1] Assisting students in/out of spa
[1] Carrying equipment up stairs
[1] Effects of photocopier. PVC's in fluro lights
[1] Insufficient training in lifting technique
[1] Moving equipment over various surface areas in one small area.
[1] Physical incompatibility with lifting partner
[1] Playground duty in large playground
[1] Positioning students
[1] Removal of difficult students 'time-out'
[1] Student 'jerks'
[1] Sudden 'dropping' of students
[1] Twisting & Turning

26. KNOW HOW W.C. WORKS

[2] Yes [10] No

27. PREPARED TO TRIAL SOME EXERCISES

[11] Yes [1] No

If No Why not

Class does not require lifting.

Male	Female
1. SEX [5] M	**1. SEX** [33] F
2. AGE [0] 30-34 [1] 35-39 [0] 40-44 [2] 45-49 [0] 50-54 [2] 55 +	**2. AGE** [5] 30-34 [6] 35-39 [5] 40-44 [5] 45-49 [10] 50-54 [2] 55 +
3. LENGTH OF SERVICE [2] 5-9 [2] 10-14 [0] 15-19 [0] 20 -24 [1] 25-29 [0] 30- 34	**3. LENGTH OF SERVICE** [1] 0-4 [10] 5-9 [9] 10-14 [6] 15-19 [2] 20 -24 [2] 25-29 [3] 30- 34
4. CONTINUOUS EMPLOYMENT [4] YES [1] NO	**4. CONTINUOUS EMPLOYMENT** [20] YES [13] NO
5. REASON FOR NO [1] Travel	**5. REASON FOR NO** [10] Maternity / Child Rearing [2] Other Employment [1] Casual [1] Moved overseas [1] Teacher exchange [1] Travel
6. CURRENT LENGTH OF SERVICE AT THIS SCHOOL (YRS) 3 → 11	**6. CURRENT LENGTH OF SERVICE AT THIS SCHOOL (YRS)** 0.34 → 28
7. IN SCHOOL CLASSIFICATION [1] Classroom teacher (including teacher librarian) [1] Cleaner [0] Clerical/office [1] Executive (Teaching) [1] Executive (Non-Teaching) [1] General Assistant [0] Teacher's Assistant	**7. IN SCHOOL CLASSIFICATION** [17] Classroom teacher (including teacher librarian) [1] Cleaner [1] Clerical/office [1] Executive (Teaching) [1] Executive (Non-Teaching) [0] General Assistant [11] Teacher's Assistant [1] Other - Support Services
8. POSITION [5] Permanent [0] Casual	**8. POSITION** [28] Permanent [5] Casual
9. WORK [5] Full time [0] Part time	**9. WORK** [26] Full time [7] Part time
10. PART- TIME AVERAGE hrs per week N/A	**10. PART- TIME AVERAGE** hrs per week 12 → 26

MALES CONTINUED	FEMALES CONTINUED
11. INJURED	**11. INJURED**
[3] YES [2] NO	[23] YES [10] NO
12. ACTIVITY WHEN INJURED	**12. ACTIVITY WHEN INJURED**
[1] Lifting beam [1] Lifting object [1] Kicked by student	[17] Lifting [11] Twisting [7] Child Dropped [5] Unloading buses [3] Restraining students [3] Wheelchairs pushed into you [2] Interacting with students [2] Positioning [2] Putting away/ lifting equipment [2] Slipping on floor [1] Camp activities [1] Crammed space [1] Playground duty [1] Pushing wheelchair
13. INJURY TYPE	**13. INJURY TYPE**
[1] sprain/strain [2] contusion	[20] sprain/strain [4] contusion [4] laceration [2] dislocation [2] fracture
14. INJURIES AFFECTED	**14. INJURIES AFFECTED**
[2] Legs and thighs [1] Lower Back [1] Hands & arms	[12] Lower Back [10] Shoulder [9] Hands & arms [6] Legs and thighs [6] Upper back [3] Elbow [3] Feet & ankles [2] Neck [1] Chest
15. INJURED MORE THAN ONCE	**15. INJURED MORE THAN ONCE**
[2] Yes [1] No	[17] Yes [6] No
16. CLAIMED W.C.Last 10 years	**16. CLAIMED W.C.Last 10 years**
[1] Yes [2] No	[18] Yes [5] No

MALES CONTINUED

17. FOR WHAT INJURIES.

[1] Sciatica -back down to right leg
[1] Spinal disc problems

18. INJURY RESULTED IN

[1] Time off work
[1] Physiotherapy
[1] Change of lifestyle when not at work

19. CONTINUED TO WORK THOUGH INJURED

[3] Yes [0] No

If Yes Why

[3] Injury not severe enough to require time off work

20. SICK LEAVE INSTEAD OF W.C.

[1] Yes
[2] No (1 no response)

21. MUSCULOSKELETAL PAIN WITHOUT INJURY

[2] Yes [1] No

FEMALES CONTINUED

17. FOR WHAT INJURIES.

[13] Backstrain
[6] Shoulder
[5] Neck injury/strain
[2] Elbow injury
[1] Badly sprained & dislocated knee
[1] Broken finger
[1] Bruising on shin
[1] Cervical disc dislocation
[1] Contusions to face/ neck arms
[1] Dislocated finger
[1] Hand injury
[1] Heel laceration
[1] Laceration to the mouth
[1] Soft tissue injury
[1] Twisted ankle
[1] Wrist injury- long term weakness

18. INJURY RESULTED IN

[20] Time off work
[18] Physiotherapy
[9] Change of lifestyle when not at work
[2] Change of work practice
[2] Surgery
[1] Hydrotherapy & exercise therapy

19. CONTINUED TO WORK THOUGH INJURED

[20] Yes [4] No
(1 responded Yes & No)

If Yes Why

[16] Injury not severe enough to require time off work
[11] Believed that the injury would fix itself
[3] Too busy to stop working
[1] Casual
[1] Had to finish the day
[1] Lower back tiredness contributed to an injury later on

20. SICK LEAVE INSTEAD OF W.C.

[15] Yes
[8] No

21. MUSCULOSKELETAL PAIN WITHOUT INJURY

[20] Yes [2] No
(1 no response)

MALES CONTINUED

22. ANY PREVENTATIVE MEASURES USED

[5] Yes [0] No

23. LIST THEM IF YES

[2] Exercise fitness activities
[1] Platform to lesson lifting height
[1] Levers to assist in lifting
[2] Careful / correct lifting
[1] Warm up exercises
[1] Maintain personal fitness

24. WHAT WAS SUCCESSFUL

[2] Exercise fitness activities
[1] Platform to lesson lifting height
[1] Levers to assist in lifting
[2] Careful / correct lifting
[1] Warm up exercises
[1] Maintain personal fitness

FEMALES CONTINUED

22. ANY PREVENTATIVE MEASURES USED

[27] Yes [6] No

23. LIST THEM IF YES

[21] Exercise fitness activities
[14] Careful / correct lifting
[7] Two person lift
[5] Yoga
[4] Lifting workshops
[4] Secure equipment
[4] Warm up exercises
[2] Minimising lifting
[1] Aware of student abilities
[1] Ensure assistance available if needed
[1] Hot showers prior to work
[1] Hydrotherapy
[1] Listen to the advice of colleagues
[1] Relaxation classes
[1] Release falling students
[1] Taking time
[1] Use of correct equipment
[1] Weight reduction

24. WHAT WAS SUCCESSFUL

[18] Regular exercise / fitness activities
[13] Careful / correct lifting technique
[3] Lifting workshops
[4] Two person lift
[2] Securing equipment
[2] Warm -up activities
[1] Hot showers prior to work
[1] Hydrotherapy
[1] Release dropping student
[3] Use correct lifting technique
[1] Listen to the advice of colleagues
[1] Minimise lifting
[1] Regular stretching
[1] Warming up shoulders prior to lifting

MALES CONTINUED

25. LIST UNSAFE DIFFICULT TASKS

[1] Continuous lifting
[1] Managing ED students in beh mod programs
[1] Restricted space
[1] Twisting & Turning
[1] Positioning students
[1] Continuous lifting
[1] No response

26. KNOW HOW W.C. WORKS

[1] Yes [4] No

27. PREPARED TO TRIAL SOME EXERCISES

[4] Yes [1] No

If No Why not

No time allowed by contract company.

FEMALES CONTINUED

25. LIST UNSAFE DIFFICULT TASKS

[11] Positioning students (+ toileting)
[12] Lifting students (part. heavy st.
[9] Supporting st. (gait / fits/ dressing)
[3] Managing ED students in beh mod programs
[3] Unexpected obstacles in pathways
[2] Very heavy students
[1] Removing student to time - out
[1] Restricted space
[2] Continuous lifting
[1] Assisting students in/out of spa
[1] Carrying equipment up stairs
[1] Effects of photocopier. PVC's in fluro lights
[1] Insufficient training in lifting technique
[1] Lifting sandbags
[1] Moving equipment over various surface areas in one small area.
[1] Opening / closing hall side doors
[1] Opening windows in room
[1] Physical incompatibility with lifting partner
[1] Playground duty in large playground
[1] Pushing/pulling chairs with bases
[1] Showering students
[1] Supporting st in equipment (walker)
[1] Time management/ demanding class
[1] Too much bending
[1] Unloading buses
[2] No response

26. KNOW HOW W.C. WORKS

[12] Yes [21] No

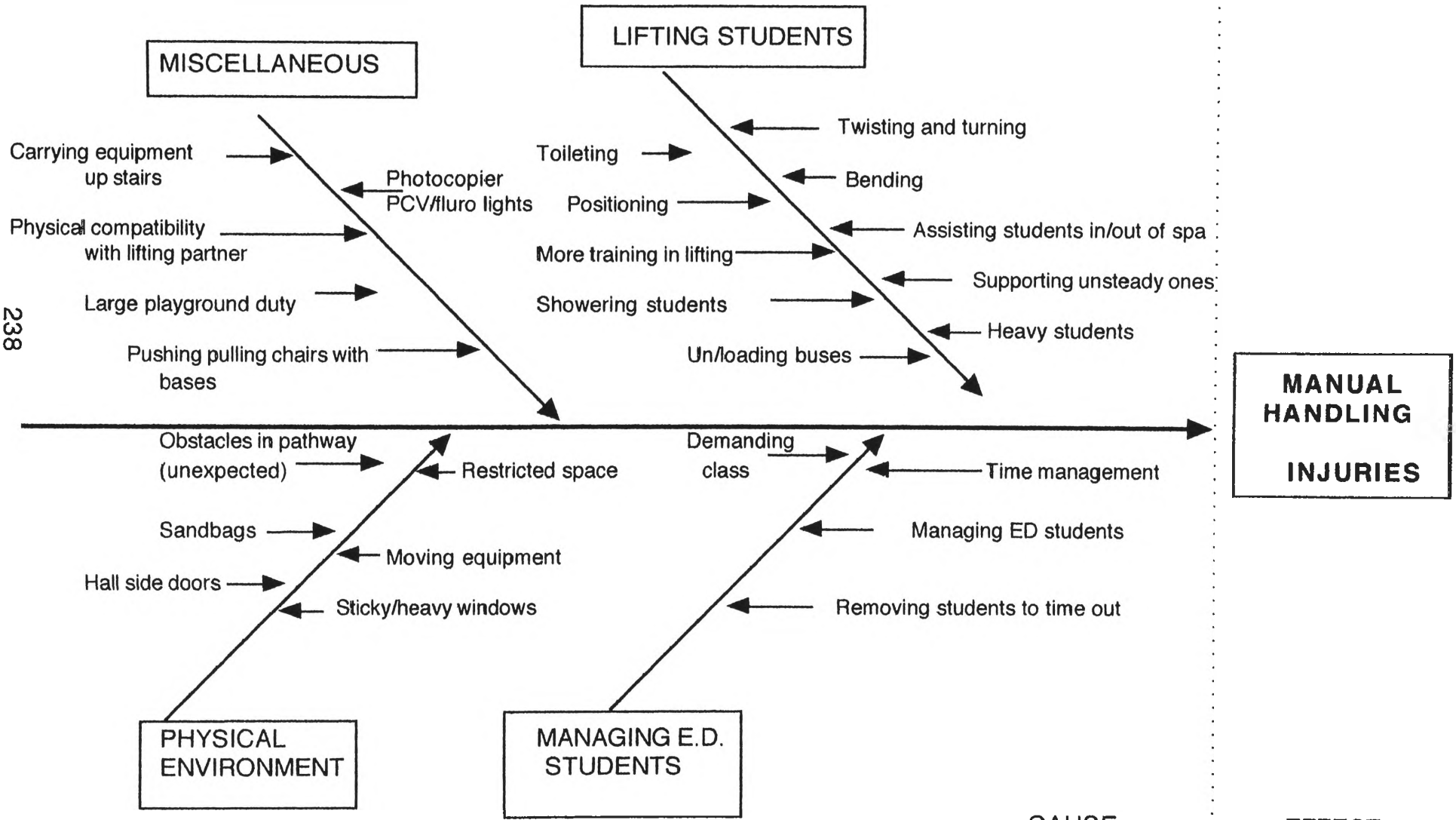
27. PREPARED TO TRIAL SOME EXERCISES

[32] Yes [1] No

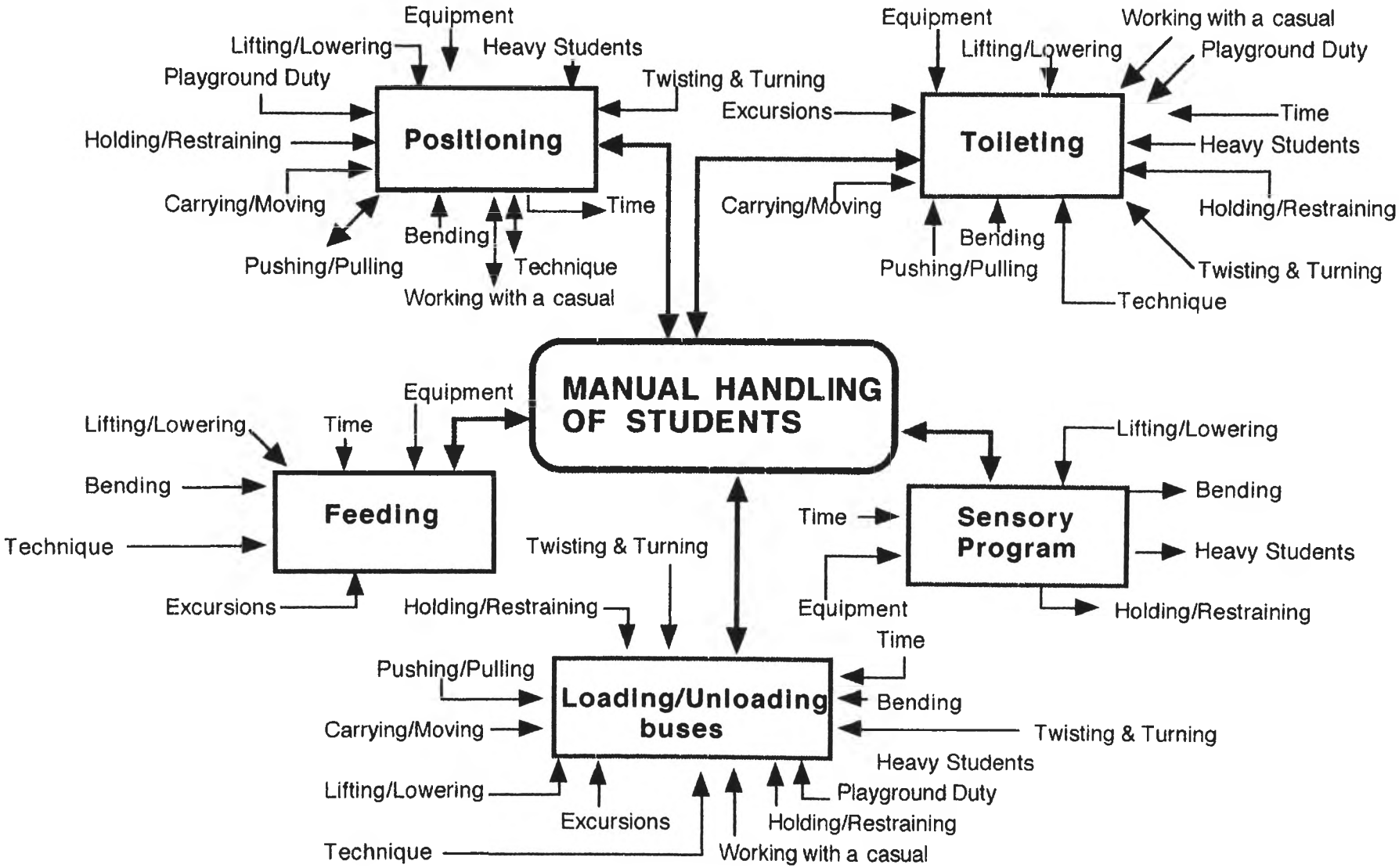
If No Why not

Class does not require lifting.

CAUSE AND EFFECT DIAGRAM



RELATIONS DIAGRAM : FACTORS AFFECTING & AFFECTED BY MANUAL HANDLING OF STUDENTS



QUESTIONNAIRE 2 RESULTS

1. Is there frequent or prolonged bending down where your hands pass below mid thigh height?

   [8] Yes [3] No

2. Is there frequent or prolonged reaching above your shoulder?

   [1] Yes [10] No

3. Is there frequent or prolonged bending due to an extended reach forward?

   [5] Yes [6] No

4. Is there frequent or prolonged twisting of your back?

   [5] Yes [5] No

   (NO RESPONSE FROM 1 RESPONDENT)

5. Are awkward postures assumed frequently or over prolonged periods, that is, postures that are not forward facing and upright?

   [6] Yes [5] No

6. Is manual handling performed frequently or for long time periods by you?

   [9] Yes [2] No

7. Are loads moved or carried over long distance?

   [1] Yes [10] No

8. Is the weight of the object:

   (a) more than 4.5 kg and handled from a seated position?

   [4] Yes [6] No

   (ONE RESPONDENT NO RESPONSE)

   (b) More than 16 kg and handled in a working posture other than seated?

   [7] Yes [4] No

   (c) More than 55kg?

   [3] Yes [8] No

9. For pushing, pulling or other application of forces, are large pushing/pulling forces involved?

[5] Yes [6] No

10. Is the load difficult or awkward to handle, for example, due to its size, shape, temperature, instability or unpredictability?

[10] Yes [1] No

11. Is is difficult or unsafe to get adequate grip of the load?

[6] Yes [5] No

12. Is the task performed in a confined space?

[7] Yes [4] No

13. Is the lighting inadequate for safe manual handling?

[1] Yes [10] No

14. Is the work environment particularly cold or hot?

[1] Yes [11] No

(ONE RESPONDENT ANS YES & NO)

15. Are the floor working surfaces cluttered, uneven, slippery or otherwise unsafe?

[4] Yes [7] No

16. Are you new to the work or returning from an extended period away from work?

[1] Yes [10] No

17. Are there age-related factors, disabilities or other special factors that may affect task performance?

[3] Yes [8] No

18. Does your clothing interfere with manual handling performance?

[0] Yes [11] No

19. Did you participate in the daily morning exercise classes?

[0] Always [1] 3 or more times per week [4] 1-3 times per week
[0] Rarely [4] Never [3] What exercise class?

20. Did you prepare your muscles by stretching prior to lifting ?

[0] Always [4] Most of the time [2] At least once a day
[4] Rarely [1] Never [0] Why stretch?

21. Do you believe these measures were effective?

Exercising

[4] did help [2] probably helped [3] too busy
[0] waste of my time (and others')

(2 RESPONDENTS NO RESPONSE)

Stretching

[4] did help [4] probably helped [2] too busy
[0] waste of my time (and others')

(ONE RESPONDENT NO RESPONSE)

ANALYSIS OF MANUAL HANDLING

Which day is your heaviest/lightest for manual handling?

Respondent	MON	TUES	WED	THURS	FRI
1 NS					
2				L	H
3	H		L		
4	L	H			
5	L	H			
6 NS					
7	L		H		
8				H	L
9		L		H	
10				H	L
11			L	H	

L = Lightest H = Heaviest NS = not specified

THE AMOUNT OF MANUAL HANDLING ON THE LIGHTEST DAY

RESPONDENT	1	2	3	4	5	6	7	8	9	10	11	TOTAL	AV
Activity	Lifting / Lowering												
Heavy	20	5	16	0	0	2	9	10	1	12	0	75	6.8
Light	12	2	0	1	0	0	10	5	2	0	0	32	2.9
Awkward	25	3	2	1	3	1	4	6	3	7	0	55	5
Activity	Pushing/Pulling											TOTAL	AV
Heavy	15	10	3	0	2	0	0	5	0	7	0	33	3
Light	15	0	1	0	0	3	4	1	0	0	0	24	2.18
Awkward	10	0	0	0	0	0	1	2	0	9	0	22	2
Activity	Carrying/Moving											TOTAL	AV
Heavy	10	1	3	0	0	0	2	5	0	7	0	28	2.54
Light	15	0	2	2	3	1	1	5	1	8	2	40	3.64
Awkward	6	1	0	2	0	1	1	1	0	3	0	15	1.36
Activity	Holding/ Restraining											TOTAL	AV
Heavy	10	0	1	0	2	0	0	2	1	4	0	20	1.81
Light	10	2	0	0	0	0	0	4	0	0	0	16	1.45
Awkward	15	0	0	0	2	1	1	7	1	13	0	40	3.64

THE AMOUNT OF MANUAL HANDLING ON THE HEAVIEST DAY

RESPONDENT 1 2 3 4 5 6 7 8 9 10 11

Activity	Lifting / Lowering											TOTAL	AV
Heavy	50	6	19	0	4	5	20	16	28	15	20	183	16.64
Light	15	2	2	2	0	2	5	6	11	0	4	49	4.45
Awkward	50	4	4	0	4	2	4	7	9	7	6	97	8.81
Activity	Pushing/Pulling											TOTAL	AV
Heavy	25	5	2	0	4	1	0	7	10	9	5	68	6.18
Light	20	2	2	0	0	3	2	3	2	0	0	34	3.09
Awkward	30	7	0	0	2	1	1	4	7	12	0	63	5.73
Activity	Carrying/Moving											TOTAL	AV
Heavy	20	1	5	2	0	3	5	7	10	10	0	63	5.73
Light	20	3	3	1	8	0	3	7	7	12	0	64	5.81
Awkward	20	0	0	1	0	1	0	2	4	3	0	31	2.82
Activity	Holding/ Restraining											TOTAL	AV
Heavy	15	0	1	0	3	1	0	3	0	9	0	32	2.91
Light	15	5	1	0	4	0	0	7	0	0	0	32	2.91
Awkward	20	1	0	0	6	1	1	12	0	22	2	65	5.91

Correspondence with Wattle St SSP

Margaret St John
Principal
Wattle St SSP

3/4/1995

Dear Margaret,

As part of my Total Quality Management Course I need to conduct some research. My proposal is to develop a Proactive Occupational Health and Safety approach within schools.

In order to be able to do this I would like to use Wattle St SSP in a pilot project.

My proposal is based upon the financial, human and social costs experienced by many staff who are engaged in day to day lifting of students as well as other lifting and stretching activities. I would like to use the staff at Wattle St SSP for the following reasons.

a) I know the school, therefore it will be easier to implement the program.
b) The school has a significant number of staff with injuries due to work practice.
c) The school is a large one with many staff.
d) It is a program that I believe will assist staff and be of value to them.

My research proposal is still in its infancy and so far I have only received verbal validation from my supervisor that it is a worthy project.

I am well aware that any research needs to be as unencumbersome as possible and also needs to have value to the school in general, and the staff in particular.

Based upon my research from last year three points are apparent.

1. The DSE is currently spending $ millions per annum on staff injuries and rehabilitation. During the 1993/94 financial year sprains and strains accounted for 45% of claims received by the South Coast Regional Office.

2. The DSE would benefit by refocusing its current O.H.&S. management practices towards a more proactive risk assessment model.

3. That DSE staff should alter their current O.H.& S. practices in line with this new DSE approach.

While the cost of these strains and sprains was only 13% of the O.H.&S. 1993/94 expenditure, there are staff at Wattle St SSP who injure themselves and many of your staff are carrying injuries. There is also a significant proportion of staff who are over 40 yrs and intend to stay at Wattle St SSP until they retire. With the removal of the retirement age, they may stay well into their 60's.

Staff have voluntarily undertaken back exercise classes, Yoga classes and relaxation and stress management activities. One aspect that has not been addressed is the area of warming-up muscles prior to engaging in lifting activities, and it is in this area that I would like to conduct my research. I plan to devise a simple (hopefully 1 A4 size sheet of paper) exercise sheet for staff using stretching and flexing as the basis utilising expertise from Wattle St SSP therapy staff.

Therefore, what I would like to do at Wattle St SSP is:

a) Distribute the attached questionnaire to all staff
b) Ask staff who lift to complete a daily checklist for a period of 4 weeks
c) Implement a 10 week exercise routine for all staff in (b) so that they stretch and flex prior to lifting or weight bearing activity (Middle of Term 2)
d) Complete a second questionnaire at the end of the project (middle of Term 3) re the project's benefit or otherwise. I have not developed this questionnaire yet.

Should this project have any merit or value the results will be communicated to the DSE via the South Coast Regional Office in an effort to extend the project to all bending and lifting situations.

I realise that you have many questions about this research and I have only provided you with the barest outline. I shall be at the WERC on Thursday for an inservice and will drop into Wattle St SSP at 3.30pm to discuss it further with you.

Regards,

Sue Goor

20/4/1995

Dear Margaret,

Please find inside this box 60 copies of the initial questionnaire, the 4 week checksheet, and a covering letter for staff. I have discussed the outline with the DSE's Personnel Manager.

Would it be possible for you to :

- ask someone to put a 'package' into each staff member's pigeon hole including the cleaners', on Monday morning.
- ask Emily if she would mind keeping the box in her office somewhere so that staff may put their completed sheets into it as they should finish.
- write something onto the sign-on book alerting staff to the package (and perhaps a suggestion as to your perception of its importance) and where to place it when complete.
- send a copy to each staff member currently on W.C. leave.
- inform me should staff want any relevant journal articles, discussion etc
- inform me re any problems

I anticipate that some staff members will :

- question the validity and relevance of what I'm trying to do.
- consider that they have enough to do without this 'extra'.
- lose their package.
- forget to complete their sheets.
- forget their allotted number.
- be unable to trace their injuries over the last 10 years.

My only hope is that at least some staff members perceive its value and endeavour to complete the tasks. The test will be if there is any reduction in the number and/or severity of musculoskeletal injuries sustained after the beginning of this period, and whether it alters any staff member's safety practice.

If it is okay with you I will stop by the school at relevant times to pick up the completed sheets and drop off the new ones. Do you think it will be necessary for me to go through the proposed exercises with staff or will they be able to internalise them from diagrams and descriptions?

Thank you for allowing me to conduct this research.

Regards Sue

Margaret St John
Principal
Wattle St SSP

15/7/1995

Dear Margaret,

Pleased find enclosed some snippets from what my research would like to achieve with your school. I have now completed my initial literature search and I hope you find the results interesting.

Literature Summary

Literature shows that the onus is quite clearly on the employer to provide a safe workplace and to ensure safe work practices. Traditionally this has occurred with management providing training and development. The prevailing attitude was -'we have done all we can, all the law requires us to do'. As a consequence this approach has not impacted greatly upon the continuously escalating occurrence and cost of injury and disease at the workplace. Costs in Australia are currently estimated at between $5 and $37 Billion per fiscal year. In the same time frame the costs associated with manual handling were estimated at approximately $1 Billion.

Intervention programs have been recommended as a way for organisations to reduce this human and physical waste. The two prominent approaches currently advocated are:

- Healthy lifestyle - fitness programs
- Accident / injury investigation programs

Proponents of both say that the results are encouraging and recommend implementation into other workplaces. Within these two approaches are two distinct strategies. One is reactive, the other proactive. Recent literature emerging suggests proactive measures are more effective and concerned with fitting the job to the worker. This is in line with the 'National Standard for Manual Handling 1991' Code of Practice. The literature continues to discuss the benefits of such strategies as risk assessment, ergonomics assessment and job redesign to name a few.

A new proactive approach encapsulating the philosophies and strategies of Total Quality Management (TQM) has been suggested by many authors. No longer is it management's responsibility to determine acceptable levels of injury, and safety programs, but the use of teams, and empowering employees to :

Stop and Analyse and Reflect upon

- work practices,
- work systems
- and ask 'how can this be improved?'.

Research shows that organisations who take this approach are saving money, and improving their productivity and workplace culture.

Yet there is still reluctance on the part of many organisations to take this proactive action. Why? Is it lack of knowledge, resistance to change, or lack of skills, or existing workplace culture?

In the area of manual handling the above issues are just as relevant. The incidence of manual handling injuries is still escalating. Many organisations have suggested /implemented an exercise program to increase employees muscle strength and flexibility. Yet, it is still not enough. There is controversy over lifting techniques, while there are advocates of abolishing

manual handling altogether and replacing it with mechanisation.

Again a total package of knowledge, understanding and most of all a commitment and ability to change to a proactive infrastructure that is focused on employee participation and continually improving is needed.

TQM deplores waste. This is what worker's compensation is - waste of human life, ability, productivity; and waste of money, machinery and time. TQM also believes that waste can and must be

- targeted
- reduced
- eliminated

through monitoring, analysing and change using empowered employees in a team approach, ergo Synergy.

What is becoming apparent is that many previous approaches relied on the 'quick fix' system when what is really needed is a long term commitment to preventing injuries and disease.

Based on this short synopsis, it became apparent that my research was leading to working with the school, rather than simply presenting a "here it is". Based upon the literature in order for a program to be most effective it needs to include the following;

- Team approach
- Priority and commitment from all staff
- Long term commitment
- Skills in risk assessment, ergonomics and proactive strategies.

Therefore what I would like to do is:

Continue with the methodology outlined to you previously but include:
Meeting with the school's OH&S committee 5-6 times this term to:

- Look at what the literature is saying
- What the possible implications are for the school
- What the school can do to address these issues.
- Whether it is time for the school to target OH&S as a priority (and for eg, devote a SDD to it) etc.

Should the committee agree with my analysis of targeting OH&S and a proactive approach then I would like to show the committee some TQM tools and strategies that could effectively target this issue.

My supervisor would also like me to be able to interview some staff to add methodological validity to my research.

Methodology Synopsis

Many approaches can be found in various journal articles. The quantity of research and interest in this area is astounding, particularly when you consider the divergent opinions presented. However, there are two areas that most research agrees with :

- the current cost of injuries is unacceptably high, and
- an intervention program will help.

There is research from America to suggest that in the manual handling industry it is beneficial to

initiate exercise classes daily, prior to the commencement of each shift. While these exercises are voluntary, reports confirm that benefits exist and musculoskeletal injuries are being reduced in terms of incidence and severity. There is also an article stating that in one particular workplace the majority of musculoskeletal injuries occurs in the first 2 hours of a shift. Research further highlights the benefits of preparing muscles immediately prior to the commencement of lifting through some stretching exercises.

At Wattle St. SSP staff have in the previous 3 years been exposed to random back exercise classes, yoga classes and there is also a weight reduction group in operation. All are voluntary and conducted outside of school hours. Attendance patterns and correlation to injury data have not been analysed. In recent weeks a daily exercise class has commenced in school time.

For the purposes of this research and as one possible solution to the problem, the plan is to act as a catalyst and facilitator. As a catalyst it is to develop and implement an intervention strategy consisting of :

1. a beginning and concluding questionnaire,
2. a four week evaluation of pain and stiffness among staff,
3. the development & implementation of a stretching and flexing program to complement the school's developed and concurrent implementation of muscle strengthening exercises.
4. analysis of existing injury record and development of a data base for future additions and use by the school.

As a facilitator to :

1. ask staff to determine the effectiveness of these strategies by sharing results of questionnaires/checklists/research with them,
2. use the school's current OH&S committee to formulate a continuous improvement process such as Plan Do Check Act (PDCA).
3. discuss benefits of a consistent approach based on teamwork,
4. empower staff through training and development about PDCA.

The real value is the establishment of an improvement infrastructure within the school.

The Total Quality Management aspect of continuous improvement must hold significant benefit in this area. The staff themselves are in the best possible position to utilise a collaborative approach along the lines of Action Research /PDCA. Research cites staff empowerment and teamwork, as beneficial in working towards continuous improvement .

INJURY RECORD DATA

Wattle St SSP 6 MONTH PERIOD FEB 1995 - JULY 1995

Injuries by **Age Band**	30- 34 yrs	35- 39 yrs	40 - 44 yrs	45- 49 yrs	50- 54 yrs	55 + yrs
No	6	6	23	25	24	7
Times						
8.45 am- 10.40 am	1	3	6	10	15	4
10.40 - 12.45 pm	3	2	8	4	5	2
12.45pm - 3.15 pm	3	1	8	5	3	1
Type of injury						
Sprains/ strains	5	4	16	17	22	8
Contusions	2	3	3	3	4	0
Broken skin	2	0	3	1	0	0
Bite	0	0	0	2	0	0
Break	0	0	0	1	1	0
Trauma	0	0	0	1	0	0
Eye Irritation					2	0
Dislocation					1	0
Location						
Arm	2	2	1	1	4	2
Finger	1	1	0	2	4	0
Chest	1	0	1	1	1	0
Shoulder	1	1	2	7	9	1
Back	1	1	6	2	2	1
Foot	1	0	0	1	3	1
Leg	2	1	1	4	3	1
Wrist	0	1	3	3	0	0
Body	0	1	0	0	0	0
Neck	0	1	0	4	3	1
Head	0	1	0	2	1	1
Hands	0	0	1	0	0	0
Ankle	0	0	1	0	0	0
Elbow	0	0	0	2	0	0
Buttock	0	0	0	1	0	1
Eye	0	0	0	1	1	0
Knee	0	0	0	2	3	1
Hip	0	0	0	1	2	1

MONTHLY INJURY ANALYSIS RECORD

MONTH_____ TERM_____ YEAR_____ MAJOR INJURIES

NUMBER INJURED _____ MALES____ FEMALES _____

LOCATION	INJURY TYPES							
	No	Sprains /strains	Contusion	Mental	Laceration	Fracture	Dislocation	Other
Head								
Eye								
Neck								
Back L								
Back U								
Abdomen								
Chest								
Buttocks								
Shoulder								
Arm								
Wrist								
Hand/Finger								
Leg								
Ankle								
Chest								
Foot								
Other								
TOTAL								

Intervention Participation	TYPES	TIME OFF WORK
YES		No of days
NO		

CLUSTER				Staff Injured Once	Staff Injured More than Once	No of staff
E	J	I	S			

Ages	Time Injuries Occurred								REASON
	Morning	Mid	Afternoon	Mon	Tues	Wed	Thurs	Fri	Work Practice
30- 34									
35- 39									Work Station
40- 44									
45- 49									Other
50- 54									
55 +									
TOTAL									

ACTIVITY WHEN INJURED					Near Misses Number
Positioning	Toileting	Playground duty	Bus duty	Other	

ACTIVITY	
REPETITIVE	SINGLE

QUARTERLY INJURY ANALYSIS RECORD

TERM _____ NUMBER INJURED_____	MAJOR
YEAR _____ MALES _____ FEMALES _____	INJURIES

LOCATION	INJURY TYPES							
	No	Sprains /strains	Contusion	Mental	Laceration	Fracture	Dislocation	Other
Head								
Eye								
Neck								
Back L								
Back U								
Abdomen								
Chest								
Buttocks								
Shoulder								
Arm								
Wrist								
Hand/Finger								
Leg								
Ankle								
Chest								
Foot								
Other								
TOTAL								

Intervention Participation	TYPES	TIME OFF WORK
YES		No of days
NO		

CLUSTER				Staff Injured Once	Staff Injured More than Once	No of staff
E	J	I	S			

Ages	Time Injuries Occurred								REASON
	Morning	Mid	Afternoon	Mon	Tues	Wed	Thurs	Fri	Work Practice
30- 34									
35- 39									Work Station
40- 44									
45- 49									Other
50- 54									
55 +									
TOTAL									

ACTIVITY WHEN INJURED					Near Misses Number
Positioning	Toileting	Playground duty	Bus duty	Other	

ACTIVITY	
REPETITIVE	SINGLE

YEARLY INJURY ANALYSIS RECORD

YEAR _____ **NUMBER INJURED** _____ **MAJOR INJURIES**

FEMALES _____ **MALES** _____

		PREVIOUS YEARS						
	No	Sprains /strains	Contusion	Mental	Laceration	Fracture	Dislocation	Other
90/91								
91/92								
92/93								
93/94								
94/95								
95/96								
AV.								

CLUSTER

E

J

I

S

Body Parts	S/S	CONT	MENT	LAC	FRAC	DISLOC	OTHER
Head							
Eye							
Neck							
Back Lower							
Back Upper							
Abdomen							
Chest							
Buttocks							
Shoulder							
Arm							
Wrist							
Hand/ Finger							
Leg							
Ankle							
Foot							
Other							
TOTAL							

Intervention

Participation

YES NO

TYPES

TIME OFF WORK

No of days

No of staff

Ages	Time Injuries Occurred							
	Morning	Mid	Afternoon	Mon	Tues	Wed	Thurs	Fri
90/91								
91/92								
92/93								
93/94								
94/95								
95/96								
AVERAGE								

REASON

Work Practice

Work Station

Other

ACTIVITY WHEN INJURED

Positioning	Toileting	Playground duty	Bus duty	Other

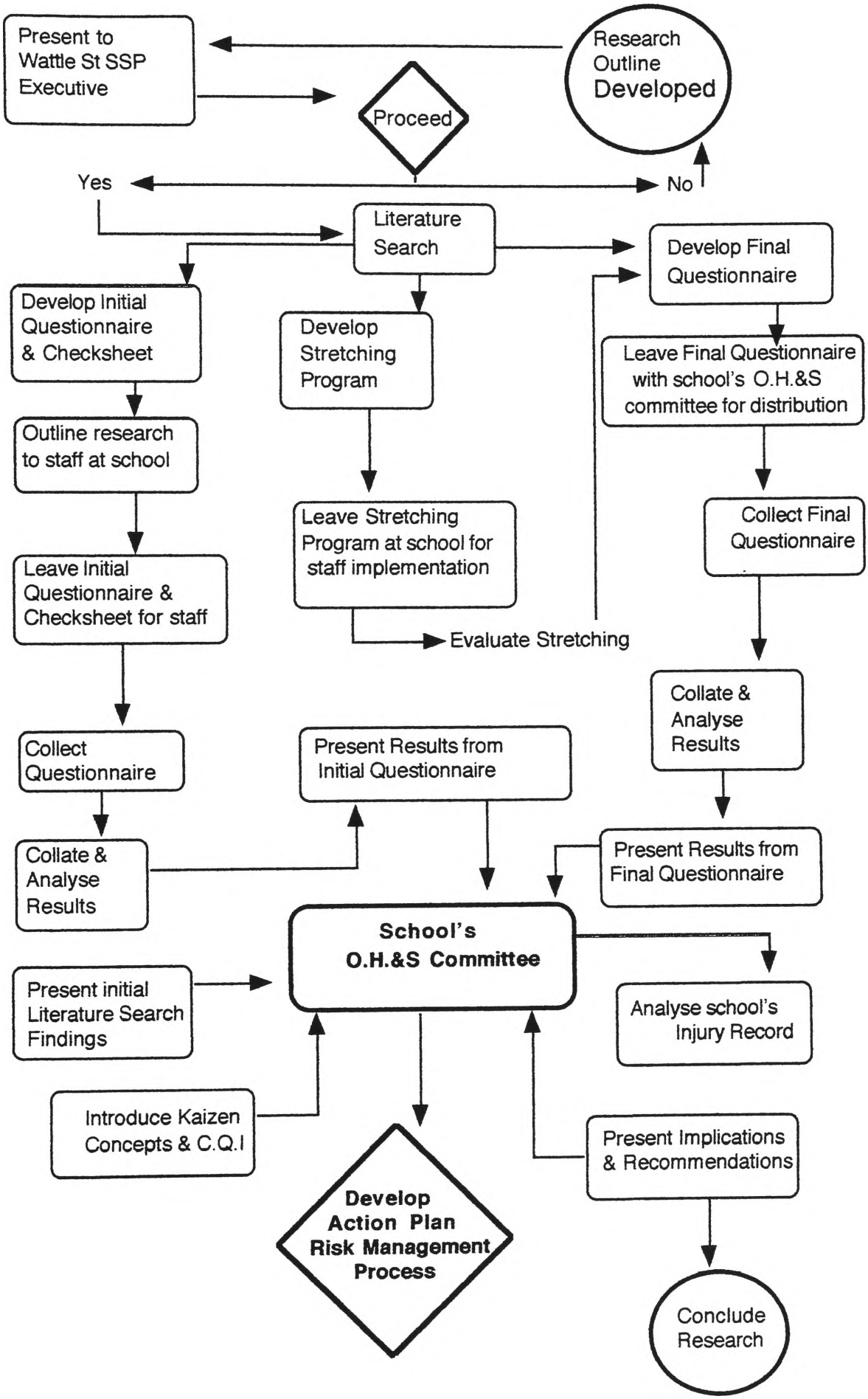
Near Misses Number

ACTIVITY REPETITIVE SINGLE

The Key Characteristics Defining an Organization's Culture

	1. Member Identity	
Job	———	Organization
	2. Group emphasis	
Individual	———	Group
	3. People focus	
Task	———	People
	4. Unit integration	
Independent	———	Interdependent
	5. Control	
Loose	———	Tight
	6. Risk tolerance	
Low	———	High
	7. Reward criteria	
Performance	———	Other
	8. Conflict tolerance	
Low	———	High
	9. Means-ends orientation	
Means	———	Ends
	10. Open-system focus	
Internal	———	External

Source: Robbins SR (1993), "Organizational Behaviour", 6th Edition,p 603


Present to Wattle St SSP Executive
Research Outline Developed
Proceed
Yes
No
Literature Search
Develop Final Questionnaire
Develop Initial Questionnaire & Checksheet
Develop Stretching Program
Leave Final Questionnaire with school's O.H.&S committee for distribution
Outline research to staff at school
Leave Stretching Program at school for staff implementation
Collect Final Questionnaire
Leave Initial Questionnaire & Checksheet for staff
Evaluate Stretching
Collate & Analyse Results
Collect Questionnaire
Present Results from Initial Questionnaire
Collate & Analyse Results
Present Results from Final Questionnaire
School's O.H.&S Committee
Present initial Literature Search Findings
Analyse school's Injury Record
Introduce Kaizen Concepts & C.Q.I
Present Implications & Recommendations
Develop Action Plan Risk Management Process
Conclude Research

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